CONTENT

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 71

A	B	C	D	E	FX
53.52	7.04	8.45	4.23	21.13	5.63

Provides: RNDr. Rastislav Krivoš-Belluš, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course:

Course level: I.

Prerequisities: ÚINF/PRR1a/15

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 42

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

Provides: RNDr. Rastislav Krivoš-Belluš, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ 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., 8.

Course level: I.

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

Conditions for course completion:
Continuous assignment - 50%
Midterm test and final test - 50%
or
The final project - 100%

Learning outcomes:
Problem solving in Python with using various modules, to implement and use algorithms to solve selected problems, knowledge of the principles of object-oriented programming and its implementation in Python.

Brief outline of the course:
Introduction to the environment, basic features of Python, syntax.
Simple types (number, logical type), structured types (string, list, dictionary, tuple, set) and control structures (loops, conditional statements, exception handling).
Definition of functions (parameters, return value, variable number of parameters, default values od parameters). Generators.
Import and creation of modules.
Documentation of functions, modules, packages.
Types of errors and error handling. Capturing and raising exceptions.
Saving data to a file and reading data from a file.
Data serialization. Open data formats.
Definition of own classes. Decorators.
Modules, packages.
Tests and test-driven programming (unittest). Logging.
Parallelism, threads and processes.
Graphic interface for Python programs.
Problem solving using Python.
Classes and objects. Iterator, context manager.
Object-oriented approach to problem solving. Custom data structures.
Selected algorithms over data structures.

Recommended literature:

Pilgrim, M., (2012) Dive Into Python 3. PILGRIM, Mark. https://github.com/downloads/diveintomark/diveintopython3/dive-into-python3.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
LOTT, Steven F. Mastering Object-oriented Python. Birmingham B3 2PB, UK: Packt Publishing, 2014. ISBN 978-1-78328-097-1.

Course language:
The primary language is Slovak, English is useful for reading Python documentation

Notes:
Required knowledge: Ability to implement simple programs in a selected programming language (eg Java, Pascal, C ...), basic knowledge of the principles of object-oriented programming.

Course assessment
Total number of assessed students: 23

A	B	C	D	E	FX
13.04	21.74	34.78	17.39	0.0	13.04

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

Date of last modification: 11.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

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: 6.

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: 134

A	B	C	D	E	FX
11.94	5.97	17.16	23.13	38.81	2.99

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

Date of last modification: 25.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 4., 6., 8.

Course level: I.

Prerequisities:

Conditions for course completion:
Oral examination.

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 832

A	B	C	D	E	FX
25.36	18.03	23.92	17.91	9.86	4.93

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

Date of last modification: 24.08.2018

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/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., 7.

Course level: I., II.

Prerequisities: ÚINF/AFJ1a/15

Conditions for course completion:
Test and oral examination.

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

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

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

Course language:

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: 01.06.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ BPO/14	**Course name:** Bachelor Thesis and its Defence

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

Number of ECTS credits: 4

Recommended semester/trimester of the course:

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 95

A	B	C	D	E	FX
44.21	27.37	13.68	8.42	6.32	0.0

Provides:

Date of last modification: 09.01.2019

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

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

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 18

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

Provides: doc. RNDr. Jozef Jirásek, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚFV/NUM/10

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

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 111

A	B	C	D	E	FX	N	P
33.33	17.12	9.91	17.12	14.41	2.7	0.0	5.41

Provides: prof. RNDr. Milan Žukovič, PhD.

Date of last modification: 19.02.2021
Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 5.

Course level: I., II.

Prerequisities:

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

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 53

A	B	C	D	E	FX
52.83	16.98	16.98	9.43	1.89	1.89

Provides: prof. RNDr. Milan Žukovič, PhD.

Date of last modification: 25.09.2017

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚINF/PAZ1a/15 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 64 points.

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

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 759

A	B	C	D	E	FX
9.62	5.27	12.38	16.47	37.29	18.97

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

Date of last modification: 06.02.2019

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/KOPR/15	**Course name:** Concurrent programming
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 5., 7.	
Course level: I.	
Prerequisities: ÚINF/PAZ1a/15 and leboÚINF/ePAZ1a/15	
Conditions for course completion: Final projects in area of parallel and distributed programming	
Learning outcomes: Ability to create thread safe programs, cooperation and synchronization of threads, design pattern "Work stealing", interruption of threads. Technologies SOAP and Akka.	
Brief outline of the course: 1, Introduction to threads 2, Stale data and data publication 3, Composing thread safe classes 4, Concurrent collections 5, Thread coordination 6, Executors 7, ForkJoinPool - work stealing pattern 8, Tasks cancellation 9, Threads in JavaFx 10, SOAP Web Services - From code to WSDL 11, SOAP Web Services - From WSDL to code 12, Actor model and Akka	
Recommended literature: 1. B. Goetz, Tim Peierls, Joshua Bloch, Joseph Bowbeer, David Holmes, Doug Lea: Java Concurrency in Practice; Addison-Wesley Professional, 2006 2. P. Hyde: Java Thread Programming; Sams, 1999 3. T. White: Hadoop: The Definitive Guide; Yahoo Press; Second Edition edition, 2010	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 78

A	B	C	D	E	FX
44.87	25.64	15.38	10.26	3.85	0.0

Provides: RNDr. Peter Gurský, PhD.

Date of last modification: 05.02.2019

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ DBdi/15	**Course name:** Database and information systems

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 11

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

Provides: doc. RNDr. Csaba Török, CSc., RNDr. Viliam Kačala, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/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:
Tests, assignments.

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

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

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

Course language:

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

Course assessment
Total number of assessed students: 710

A	B	C	D	E	FX
10.0	8.45	12.25	24.08	34.93	10.28

Provides: doc. RNDr. Csaba Török, CSc.

Date of last modification: 30.03.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ VMA1/15	**Course name:** Development of mobile applications

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., 8.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 73

A	B	C	D	E	FX
57.53	4.11	12.33	5.48	1.37	19.18

Provides: RNDr. Róbert Novotný, PhD., RNDr. Miroslav Opiela, PhD.

Date of last modification: 02.07.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/DT1/19	**Course name:** Digital technologies for public administration I.

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 7.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n	neabs	z
83.33	0.0	16.67	0.0

Provides: Mgr. Michaela Linková

Date of last modification: 13.12.2018

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/DT2/19	**Course name:** Digital technologies for public administration II.

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 8.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 1

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

Provides: RNDr. Slavka Blichová, Mgr. Michaela Linková

Date of last modification: 13.12.2018

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

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

Course level: I.

Prerequisities:

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

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

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

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

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 274

A	B	C	D	E	FX
5.47	2.92	9.49	16.79	52.55	12.77

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

Date of last modification: 22.09.2019

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities:

Conditions for course completion:
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: 2605

A	B	C	D	E	FX
37.16	25.03	17.04	10.21	8.29	2.26

Provides: Mgr. Lenka Klimčáková, Mgr. Barbara Mitríková, Mgr. Viktória Mária Slovenská, PhDr. Helena Petruňová, CSc.

Date of last modification: 14.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ABSP/16	**Course name:** Essentials of ABAP

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

Number of ECTS credits: 3

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

Course level: I., N

Prerequisities: ÚINF/ZTSP/16

Conditions for course completion:

Learning outcomes:

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

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 55

A	B	C	D	E	FX
30.91	43.64	20.0	1.82	0.0	3.64

Provides:

Date of last modification: 24.08.2016

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ZSSP/16	**Course name:** Essentials of the SAP System for Users

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

Number of ECTS credits: 3

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

Course level: I., N

Prerequisities: ÚINF/ZTSP/16

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Characteristics of modern systems, effective solutions for the management and operation of institutions, fundamental processes in the institution of government, support for the process from the system. SAP user roles and profiles, case studies in terms of deployment of SAP company.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 77

abs	n	neabs
94.81	2.6	2.6

Provides: Ing. Slávka Šimková, PhD., RNDr. Slavka Blichová

Date of last modification: 24.08.2016

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

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

Course level: I., N

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
Defining mySAP Technology (Products, Innovations provided by SAP), Navigation (Logon, Screen Design, Calling Functions), System Kernel (Client/Server Architecture, Structure of an SAP system, Processing in SAP), Communication and Integration Technologies (Remote Function Calls, Internet Technologies).

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 339

abs	n	neabs
96.76	1.18	2.06

Provides: Ing. Slávka Šimková, PhD., RNDr. Slavka Blichová

Date of last modification: 24.08.2016

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 7.

Course level: I.

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

Conditions for course completion:

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 249

A	B	C	D	E	FX
21.29	15.26	15.66	14.46	32.53	0.8

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 8.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

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

Provides: RNDr. Martin Vaľa, PhD.

Date of last modification: 30.03.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

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

Course level: I., II.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 25

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

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 4., 6., 8.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 28

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

Provides: RNDr. JUDr. Pavol Sokol, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ZIV1/16	**Course name:** Internet of Things

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., 8.

Course level: I.

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

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX
89.29	10.71	0.0	0.0	0.0	0.0

Provides: RNDr. František Galčík, PhD., RNDr. Miroslav Opiela, PhD.

Date of last modification: 03.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

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

Course level: I., II.

Prerequisities:

Conditions for course completion:

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 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: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 7.

Course level: I.

Prerequisities:

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

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

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

Recommended literature:
(1) Selected slovak legislation

Course language:

Notes:

Course assessment
Total number of assessed students: 12

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

Provides: RNDr. JUDr. Pavol Sokol, PhD.

Date of last modification: 14.01.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

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

Course level: I., II.

Prerequisities:

Conditions for course completion:
Evaluation of projects created for neural network applications.
Written and oral exam.

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

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

Recommended literature:
J. Hertz, A.Krogh, R.G. Palmer: Introduction to the theory of neural computation, Addison Wesley, 1991
HASSOUN, M. H.: Fundamentals of artificial neural networks, The MIT Press, 1995.
Mitchell, M. (1998). An introduction to genetic algorithms. MIT press.

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.

Date of last modification: 10.02.2021
Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

Conditions for course completion:
Examination

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

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

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

Course language:
Slovak or English

Notes:
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

Date of last modification: 10.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 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., RNDr. Ondrej Krídlo, PhD., Mgr. Alexander Szabari, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

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

Course assessment
Total number of assessed students: 50

A	B	C	D	E	FX
16.0	22.0	20.0	12.0	22.0	8.0

Provides: RNDr. JUDr. Pavol Sokol, PhD.

Date of last modification: 14.01.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4., 8.

Course level: I., II.

Prerequisities:

Conditions for course completion:

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 266

A	B	C	D	E	FX
22.93	11.28	13.16	24.44	26.32	1.88

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 8.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX
26.67	46.67	13.33	13.33	0.0	0.0

Provides: prof. RNDr. Gabriel Semanišin, PhD.

Date of last modification: 22.05.2018

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚMV/ MZIa/10	**Course name:** Mathematical foundations of informatics I
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 2 / 2 **Per study period:** 28 / 28 **Course method:** present	
Number of ECTS credits: 6	
Recommended semester/trimester of the course: 1.	
Course level: I.	
Prerequisities:	
Conditions for course completion: Two tests and completion of individual homework. Assessment is given on the basis of semestral evaluation and examination test.	
Learning outcomes: To obtain basic mathematical knowledge in arithmetic, linear algebra and elementary calculus. To become familiar with the applications of some fundamental mathematical concepts. To learn to work with mathematical software and together with the acquired knowledge to use it in solving various types of problems.	
Brief outline of the course: Integers and divisibility. Prime numbers and congruences. Applications of congruences and congruence classes. Matrices and determinants. Applications of matrices and determinants. Functions and their properties. Elementary functions. Limit of a function. Continuity and derivative of a function. Applications of derivatives.	
Recommended literature: Hallet D. H. (2014). Applied Calculus. John Wiley & Sons. Koshy T. (2007). Elementary Number Theory with Applications. Elsevier. Lay D. C. (2012). Linear Algebra And Its Applications. Boston: Addison-Wesley. Studenovská D., Madaras T. (2006). Matematika pre nematematické odbory. UPJŠ. Studenovská D., Madaras T., Mockovciak S. (2006). Zbierka úloh z matematiky pre nematematické odbory. UPJŠ. Zimmermann P. et al. (2018). Computational Mathematics with SageMath. Springer.	
Course language: Slovak	
Notes:	

Course assessment
Total number of assessed students: 196

A	B	C	D	E	FX
0.51	9.69	9.18	19.39	47.96	13.27

Provides: prof. RNDr. Tomáš Madaras, PhD., RNDr. Juraj Hudák

Date of last modification: 19.09.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚMV/MZIb/10	**Course name:** Mathematical foundations of informatics II

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

Number of ECTS credits: 6

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚMV/MZIa/10

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

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

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

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

Course language:
Slovak

Notes:

Course assessment
Total number of assessed students: 111

A	B	C	D	E	FX
0.9	9.01	8.11	22.52	52.25	7.21

Provides: prof. RNDr. Tomáš Madaras, PhD., RNDr. Juraj Hudák

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 8.

Course level: I., II.

Prerequisities:

Conditions for course completion:

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

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

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

Course language:

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

Course assessment
Total number of assessed students: 142

A	B	C	D	E	FX
16.2	19.01	24.65	21.13	17.61	1.41

Provides: doc. RNDr. Csaba Török, CSc.

Date of last modification: 30.03.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ NOT1a/03	**Course name:** Nontraditional Optimization Techniques I
Course type, scope and the method: **Course type:** Lecture / Practice **Recommended course-load (hours):** **Per week:** 2 / 2 **Per study period:** 28 / 28 **Course method:** present	
Number of ECTS credits: 5	
Recommended semester/trimester of the course: 7.	
Course level: I., II.	
Prerequisities:	
Conditions for course completion: Monitoring progress in solving applied projects. examination (50%), quality of the project (50%) examination	
Learning outcomes: To familiarize students with biologically and physically inspired optimization, simulation and prediction techniques. To expand students' creativity and programming skills by applying heuristic techniques in solving applied problems.	
Brief outline of the course: Fundamentals of optimization theory. Basic optimization problems. Basic types of objective functions. Classification of optimization techniques. Gradient-based optimization techniques. Evolutionary algorithms. Genetic algorithms. Genetic algorithms as Markov processes. Statistical Mechanics Approximations of Genetic Algorithms. Monte Carlo simulation and simulated annealing. Swarm optimization. Cellular Automata and their applications in simulations of complex systems. Fractals. Agent-based models. Evolutionary games. Evolution of cooperation. Fundamentals of Neural Networks. Application of singular value decomposition to solve least squares problems.	
Recommended literature: Hartmann, A. K., Rieger, H., Optimization Algorithms in Physics, Wiley, 2002 Reeves, C. R., Rowe, J. E., Genetic Algorithms: Principles and perspectives, Kluwer, 2003 Mitchell, M., Complexity. A Guided Tour, Oxford University Press, 2009 Solé, R. V., Phase Transitions, Princeton University Press, 2011 Ilachinski, A., Cellular Automata. A Discrete universe, World Scientific, 2002 Haykin, S., Neural Networks. A Comprehensive Foundation, Prentice-Hall, 1999	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 81

A	B	C	D	E	FX
69.14	17.28	7.41	2.47	3.7	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 8.

Course level: I., II.

Prerequisities:

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

Learning outcomes:
By using examples from the biology to learn applications of optimization techniques on study and interpretation of complex systems. Introduction to new paradigms in the area of systems biology, including parasite/host coevolution.

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

Recommended literature:
The actual scientific papers.

Course language:

Notes:

Course assessment
Total number of assessed students: 44

A	B	C	D	E	FX
88.64	4.55	4.55	2.27	0.0	0.0

Provides: doc. RNDr. Jozef Uličný, CSc.

Date of last modification: 27.03.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/NUM/10	**Course name:** Numerical Methods

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

Number of ECTS credits: 4

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

Course level: I.

Prerequisities:

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

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 130

A	B	C	D	E	FX
15.38	16.92	25.38	22.31	15.38	4.62

Provides: prof. RNDr. Milan Žukovič, PhD.

Date of last modification: 28.03.2019

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/OSY1/15	**Course name:** Operating systems
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.	
Prerequisities: ÚINF/PRP2/15,(ÚINF/PAZ1a/15 and leboÚINF/ePAZ1a/15 and leboÚINF/PRG1/15)	
Conditions for course completion: Test and oral exam	
Learning outcomes: To gain knowledge about the basic architecture of the operating system. Understand algorithms for multi-process CPU allocation, interprocess communication, and memory allocation. To be able to apply basic synchronization procedures and to solve problems of allocation of common resources for I / O operations. 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: Operating system structure and basic functions. Different kinds of operating systems and their history. Multiprogramming, context switching, interrupts, time sharing, interoperability. Processes, process management, threads, scheduling, interprocess communication (race condition, mutual exclusion, deadlock, starvation). Memory management, relocation, segmentation, paging, virtual memory. I/O management, device drivers, interrupt handlers. External memory (disk) - direct and sequential access. File systems, file operations, directories, access control, access rights.	
Recommended literature: 1. A. Silberschatz, G. Gagne, P. Baer: Operating System Concepts, Wiley, 2002 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: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 133

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

Provides: doc. RNDr. Jozef Jirásek, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 7.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 35

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

Provides: doc. RNDr. Karol Flachbart, DrSc.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

Conditions for course completion:

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 222

A	B	C	D	E	FX
26.58	14.41	15.77	13.06	24.32	5.86

Provides: RNDr. Juraj Šebej, PhD.

Date of last modification: 13.01.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ PBS/15	**Course name:** Pro-seminar to bachelor thesis
Course type, scope and the method: **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: 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: 289

abs	n
93.77	6.23

Provides: RNDr. Ľubomír Antoni, PhD.
Date of last modification: 26.01.2021
Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 4., 8.

Course level: I.

Prerequisities: (ÚINF/PAZ1b/15 and leboÚINF/ePAZ1b/15),ÚINF/DBS1a/15,ÚINF/SWI1a/15

Conditions for course completion:
The assessment includes the continuous evaluation of partial tasks related to complex project solving during semester.
The final evaluation is awarded on the basis of the continuous evaluation and the result of the exam. The exam requires demonstration of the ability to orientate oneself in the lectured issues, mastering the theoretical foundations of process modeling, basic skills for the creation and interpretation of process models. The exam consists of written and oral part.

Learning outcomes:
To get acquainted with the theoretical foundations of process modeling. To master the basic principles of creating process models. To get acquainted with standard languages for process modeling and gain practical experience in creating models using selected modeling tools.

Brief outline of the course:
Introduction to process modeling. Approaches to the development of large software systems. Theoretical foundations of process modeling. Petri nets. Process orchestration. Process choreography. Selected process properties. Process model architectures. Methodologies and standards.

Recommended literature:
1. Ehrig, H.; Juhas, G.; Padberg, J.; Rozenberg, G. (Eds.), Advances in Petri Nets, Lecture Notes in Computer Science , Vol. 2128 (2001)
2. Eshuis, R. ; Wieringa R.: Comparing Petri Net and Activity Diagram Variants for Workflow Modelling – A Quest for Reactive Petri Nets, [dostupné online http://is.tm.tue.nl/staff/heshuis/pnt.pdf]
3. Madison D., Process Mapping, Process Improvement and Process Management, Paton Press 2005
4. Weske, M. Business Process Management, Springer 2007
5. White S.A., Miers D., Fischer L., BPMN Modeling and Reference Guide, Future Strategies Inc., Lighthouse Pt 2008
6. White:, S.A. Process Modeling Notations and Workflow Patterns, [available online http://www.omg.org/bp-corner/bp-files/Process_Modeling_Notations.pdf]

Course language:
Slovak or English

Notes:
Content prerequisities: programming, bases of software engineering and database management systems, bases of project management

Course assessment
Total number of assessed students: 32

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

Provides: prof. RNDr. Gabriel Semanišin, PhD.

Date of last modification: 23.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ OP/14	**Course name:** Professional experience
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week: Per study period:** 2t **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 7.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 10

abs	n
100.0	0.0

Provides: Mgr. Alexander Szabari, PhD., Ing. Miron Kuzma, PhD.
Date of last modification: 03.05.2015
Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

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

Course level: I., II.

Prerequisities:

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

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 218

A	B	C	D	E	FX
34.4	19.27	17.43	14.22	10.55	4.13

Provides: RNDr. PhDr. Peter Pisarčík, RNDr. Patrik Pekarčík

Date of last modification: 07.09.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I.

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

Conditions for course completion:

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

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

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

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 12

abs	n	neabs	z
66.67	33.33	0.0	0.0

Provides: PaedDr. Ján Guniš, PhD.

Date of last modification: 27.03.2020

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ ePAZ1a/15	**Course name:** Programming, algorithms, and complexity

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

Number of ECTS credits: 8

Recommended semester/trimester of the course: 1.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

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

Course language:

Notes:

Course assessment
Total number of assessed students: 46

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

Provides: RNDr. Zuzana Bednárová, PhD., RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ePAZ1b/15	**Course name:** Programming, algorithms, and complexity

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

Number of ECTS credits: 7

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities: ÚINF/ePAZ1a/15

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 33

A	B	C	D	E	FX
9.09	15.15	6.06	12.12	9.09	48.48

Provides: RNDr. Zuzana Bednárová, PhD., RNDr. Juraj Šebej, PhD., RNDr. Miroslav Opiela, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/PAZ1c/17	**Course name:** Programming, algorithms, and complexity

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

Number of ECTS credits: 5

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

Course level: I., II.

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

Conditions for course completion:
Active attendance at seminars, creation of two team projects.

Learning outcomes:
Gain skills to design and implement complex application with three-layer architecture and well-known design patterns. Ability to create REST server and simple Angular application with ability to communicate with the REST server.

Brief outline of the course:
1. Classes, methods and properties identification. Entities. Unit testing in JUnit.
2. Intorduction to JavaFx, FXML, Scene Builder, Controller.
3. Model-view-controller pattern, classes Observable and Property, model of models, persistent layer, entities and identifiers, CRUD repository in main memory, connection between GUI and persistent layer.
4. Interfaces for DAO objects, class relationships with static association. Pros and cons in hardwired associations. Implementing Factory design pattern as an abstraction of hardwired association. Enum. Implementation of database persistent layer, configuration od JDBCTemplate and RowMapper.
5. Inserting data by JDBCTemplate, Associations between classes. Cardinalities: 1:1, 1:M, 1:N. Design and realization in the code. Design of complex data model, ResultSetExtractor.
6. Business layer, three-layer architecture, modal windows, editing entities in JavaFx and MySQL.
7. Logging with default tools and with `slf4j` library. Logging best practices.Safe password storage.
8. Annotations, lambda expressions, generic classes
9. Spring Boot and REST services. Json format.
10. Angular - Installation, TypeScript, DOM model, components and their properties, events listeners in components.
11. Angular - components interaction, forms, input validation.
12. Angular - services, Observable, injection, communication with REST server via HTTP.

Recommended literature:
1. SIERRA, K., BATES, B.: Head First Java (2nd Edition), 2005
2. ECKEL, B.: Thinking in Java (4th Edition), 2006
3. Angular Docs, typescript. Dostupné na internete: https://angular.io/docs/ts/latest/

Course language:
Slovak or English.

Notes:

Course assessment
Total number of assessed students: 343

A	B	C	D	E	FX
32.65	17.78	16.62	15.45	13.12	4.37

Provides: RNDr. Peter Gurský, PhD.

Date of last modification: 05.02.2019

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

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

Course level: I.

Prerequisities:

Conditions for course completion:
Activity in exercises, elaboration of home assignments. Presentation of the results achieved in solving a specific problem. Uploading a software work.

Learning outcomes:
Acquire the way of working on a software work, communication in a software team, solving problems of computer systems administration in all phases of their life cycle.

Brief outline of the course:
Work in a 2-4 member team on the development, testing of a software product under the guidance of a mentor from software companies. Getting acquainted with continuous integration and working with git in command lines.

Recommended literature:
1. https://www.udemy.com/course/ Git & GitHub - The Complete Git & GitHub
2. https://www.jenkins.io/doc/
3. Study literature tied to the selected project (according to the client's recommendation)

Course language:
Slovak or English

Notes:
Content prerequisities:
advanced programming skills

Course assessment
Total number of assessed students: 95

A	B	C	D	E	FX
70.53	5.26	8.42	11.58	3.16	1.05

Provides: Mgr. Alexander Szabari, PhD.

Date of last modification: 25.03.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

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

Course level: I.

Prerequisities:

Conditions for course completion:
Presentation of the results achieved in solving a specific problem. Uploading a software work. Preparation of materials for the promotion of the final work.

Learning outcomes:
Acquire the way of working on the software work with agile methodology, communication in the software team, solving problems of computer systems administration in all phases of their life cycle.

Brief outline of the course:
Work in a 4-5 member team on the development, testing of a software product under the guidance of a mentor from software companies. Improving with continuous integration and working with git in command lines. Software development using Agile methodology.

Recommended literature:
1. https://www.udemy.com/course/ Git & GitHub - The Complete Git & GitHub
2. https://www.jenkins.io/doc/
3. Study literature tied to the selected project (according to the client's recommendation)
4. "What is Agile Software Development?". Agile Alliance. 8 June 2013. Retrieved 4 April 2015.

Course language:
Slovak or english

Notes:
Content prerequisities:
advanced programming skills

Course assessment
Total number of assessed students: 70

A	B	C	D	E	FX
64.29	11.43	8.57	7.14	2.86	5.71

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

Date of last modification: 25.03.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 3.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 10

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

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

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

Course level: I.

Prerequisities:

Conditions for course completion:
term project

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

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

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

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 67

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

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/BAPS/15	**Course name:** Security and administration of computer systems
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities: ÚINF/KRS/15,(ÚINF/ADL1/15 and leboÚINF/ADW1/15),(ÚINF/ARP1/15 and leboÚINF/FAN/15),ÚINF/SKB1/15	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment

Total number of assessed students: 2

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

Provides:
Date of last modification: 09.04.2018
Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ BSI1a/15	**Course name:** Seminar in informatics

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

Number of ECTS credits: 2

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

Course level: I.

Prerequisities:

Conditions for course completion:
Presentation of algorithms for problems of a higher complexity. Presentation of results connecting to the bachalor theses, known and own results.

Learning outcomes:
To inform students about new results in informatics with the goal using them in bachalor theses.

Brief outline of the course:
The seminar has a connection to the bachalor theses and to the repetitorium in informatics. Students present results of their work once in semester at least.

Recommended literature:
Sources of problems:
www.ksp.sk
www.ksp.sk/MOP/
Special research literature according to bachalor theses.

Course language:

Notes:

Course assessment
Total number of assessed students: 215

A	B	C	D	E	FX
21.4	18.6	24.19	17.21	16.74	1.86

Provides: RNDr. Zuzana Bednárová, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/BSI1b/15	**Course name:** Seminar in informatics

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

Number of ECTS credits: 2

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

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To inform students about new results in informatics with the goal using them in bachalor theses. To repeat important knowledges in informatics.

Brief outline of the course:
The seminar has a connection to the bachalor theses and to the repetitorium in informatics. Students present results of their work once in semester at least. To get credits, it is necessary to get the developed number of points from repetitorium.

Recommended literature:
Sources of problems:
www.ksp.sk
www.ksp.sk/MOP/
Special research literature according to bachelor theses.

Course language:

Notes:

Course assessment
Total number of assessed students: 127

A	B	C	D	E	FX
26.77	21.26	25.98	14.96	9.45	1.57

Provides: RNDr. Zuzana Bednárová, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 7.

Course level: I., II.

Prerequisities:

Conditions for course completion:

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

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

Recommended literature:
Internet sources and specifications.

Course language:

Notes:

Course assessment
Total number of assessed students: 92

A	B	C	D	E	FX
65.22	20.65	11.96	1.09	1.09	0.0

Provides: RNDr. Rastislav Krivoš-Belluš, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities: ÚINF/UGR1/15

Conditions for course completion:

Learning outcomes:

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

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 41

A	B	C	D	E	FX
75.61	12.2	7.32	2.44	0.0	2.44

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/PRIS/15	**Course name:** Software and information system
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS credits: 4	
Recommended semester/trimester of the course:	
Course level: I.	
Prerequisities: ÚINF/ASU1/15,(ÚINF/TVP1/15 and leboÚINF/TVP1/21),ÚINF/PMO1/15,ÚINF/SWI1b/15	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX
25.0	17.86	35.71	10.71	10.71	0.0

Provides:
Date of last modification: 21.08.2018
Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 4.

Course level: I.

Prerequisities: ÚINF/DBS1a/15 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: 294

A	B	C	D	E	FX
18.03	20.75	20.41	18.37	21.09	1.36

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities: ÚINF/SWI1a/15

Conditions for course completion:

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

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

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 255

A	B	C	D	E	FX
45.88	20.0	11.76	7.84	13.33	1.18

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 7.

Course level: I.

Prerequisities: ÚINF/PBS/15

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

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

Course language:

Notes:

Course assessment
Total number of assessed students: 130

abs	n
96.15	3.85

Provides: RNDr. Ľubomír Antoni, PhD.

Date of last modification: 26.01.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 8.

Course level: I.

Prerequisities: ÚINF/BZP1a/15

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

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

Course language:

Notes:

Course assessment
Total number of assessed students: 108

abs	n
99.07	0.93

Provides: RNDr. Ľubomír Antoni, PhD.

Date of last modification: 26.01.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

Conditions for course completion:
Exam

Learning outcomes:
Introduction to probability theory and mathematical statistics.

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 85

A	B	C	D	E	FX
20.0	12.94	7.06	7.06	52.94	0.0

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

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 2

Recommended semester/trimester of the course: 5.

Course level: I.

Prerequisities:

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

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 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: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 4

Recommended semester/trimester of the course: 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: 171

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

Provides:

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

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

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

Number of ECTS credits: 5

Recommended semester/trimester of the course: 6.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

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

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

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

Course language:

Notes:

Course assessment
Total number of assessed students: 43

A	B	C	D	E	FX
18.6	25.58	25.58	11.63	18.6	0.0

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

Date of last modification: 18.10.2016

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ ZPIa/18	**Course name:** Thesis in informatics

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: 7.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 49

A	B	C	D	E	FX
79.59	8.16	8.16	2.04	0.0	2.04

Provides: RNDr. Peter Gurský, PhD., RNDr. Miroslav Opiela, PhD., RNDr. Ľubomír Antoni, PhD., RNDr. Juraj Šebej, PhD., RNDr. Tomáš Bajtoš, RNDr. Zuzana Bednárová, PhD., prof. RNDr. Stanislav Krajči, PhD., RNDr. Ondrej Krídlo, PhD., RNDr. František Galčík, PhD., RNDr. Rastislav Krivoš-Belluš, PhD., MSc. Terézia Mézešová, Mgr. Alexander Szabari, PhD., doc. RNDr. Csaba Török, CSc., RNDr. JUDr. Pavol Sokol, PhD., doc. Ing. Norbert Kopčo, PhD., RNDr. Patrik Pekarčík, RNDr. Viliam Kačala, PhD., doc. RNDr. Gabriela Andrejková, CSc.

Date of last modification: 17.06.2018

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚINF/ZPIb/18	**Course name:** Thesis in informatics

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: 8.

Course level: I.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 33

A	B	C	D	E	FX
72.73	12.12	9.09	0.0	3.03	3.03

Provides: RNDr. Ľubomír Antoni, PhD., RNDr. Tomáš Bajtoš, RNDr. Zuzana Bednárová, PhD., PaedDr. Ján Guniš, PhD., RNDr. Miroslav Opiela, PhD., MSc. Terézia Mézešová, RNDr. Ondrej Krídlo, PhD., RNDr. Rastislav Krivoš-Belluš, PhD., RNDr. Peter Gurský, PhD., RNDr. JUDr. Pavol Sokol, PhD., prof. RNDr. Stanislav Krajči, PhD., doc. Ing. Norbert Kopčo, PhD., RNDr. Viliam Kačala, PhD., doc. RNDr. Csaba Török, CSc., RNDr. Patrik Pekarčík

Date of last modification: 17.06.2018

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ TYS1/15	**Course name:** Typographical systems
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of ECTS credits: 2	
Recommended semester/trimester of the course: 6., 8.	
Course level: I.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes: To provide the basic information on principles for typesetting of documents containing mathematical formulas in Plain TeX, AMS-TeX, and LaTeX.	
Brief outline of the course: Typesetting of a plain text, special text symbols, using of text fonts. TeX macros. Enumerations in text and footnote command. Parameter setting determining the appearance of the pages. Typesetting of mathematical formulas in text and displays, aligning formulas. Definitions of TeX macros. Making tables and pictures. Definitions, theorems, and proofs in a mathematical document. Contents, bibliography, sections in a document.	
Recommended literature: 1. D. E. Knuth, The TeXbook, Computers and Typesetting, Addison-Wesley, Reading, Massachusetts, 1986. 2. M. Doob, Jemný úvod do TeXu, CSTUG, 1990; èeský preklad z "A Gentle Introduction to TeX" (text vo¾ne prístupný v CTAN archíve). 3. O. Ulrych, AMS-TeX za 59 minút, (verzia 1.0), Praha, 1989. 4. J. Chlebíková, AMS-TeX (verzia 2.0), Bratislava, 1992. 5. M. Spivak, The Joy of TeX, Amer. Math. Soc., 1986. 6. L. Lamport, LaTeX: A Document Preparation System, Addison-Wesley, Massachusetts, 1986. 7. L. Lamport, MakeIndex: An index processor for LaTeX, 17 February 1987. 8. J. Rybièka, LaTeX pro začátečníky, Konvoj, Brno, 1995. 9. H. Partl, E. Schlegl, I. Hyna, P. Sýkora, LaTeX – Stručný popis. 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). 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 12. G. Grätzer, Math into LaTeX, 3rd edition, Birkhäuser, Boston, 2000.	
Course language: Slovak or english	

Notes:

Course assessment
Total number of assessed students: 246

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

Provides: prof. RNDr. Stanislav Krajči, PhD.

Date of last modification: 10.02.2021

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚINF/ ePOS2a/15	**Course name:** User environments of operating systems

Course type, scope and the method:
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:
Test - solving practical tasks.
final test

Learning outcomes:
To be familiar in user interfaces of operation systems Windows and Linux, to know their options, advantages, disadvantages and differences.
To know, how to configure basic parameters, to install basic system software and to use internal and external devices.

Brief outline of the course:
OS Windows - user accounts management, sharing, mounting remote directories. Processes, monitoring and modification of system parameters. Connecting to the Internet, settings and monitoring, firewall.
Basic features of FAT a NTFS file systems. Disk management, backups, recovery. File and directory permissions. Making links to files and directories. Virtualization and emulation of OS.
OS GNU/Linux, directories structure, shell. Running jobs, scheduling, jobs on background. Managing with files and directories, backups, file permissions, user groups. Connecting to the Internet. Firewall. Programs installation, Package managers, actualization. Backups on local and remote storage. Imaging. RAID field Management.

Recommended literature:
1. O. Bitto: Microsoft Windows 7, Podrobná užívatelská příručka, Computer Press, 2011.
2. P. Broža, J. Hlavenka, J. Bednařík: Microsoft Windows XP (Užívateľská príručka), Computer Press, 2006.
3. S. Shah, W. Soyinka: Administrace systému Linux, Grada, 2007.
4. Linux - Dokumentační projekt, Computer Press, 2007.

Course language:

Notes:

Course assessment
Total number of assessed students: 15

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

Provides: RNDr. JUDr. Pavol Sokol, PhD.

Date of last modification: 03.05.2015

Approved: prof. RNDr. Gabriel Semanišin, PhD.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

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

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

Number of ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: I.

Prerequisities:

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

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

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

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

Course language:
slovak

Notes:

Course assessment
Total number of assessed students: 33

abs	n	neabs	z
60.61	39.39	0.0	0.0

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

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