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COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-127/15	**Course title:** Advanced Computer Graphics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAGDM/2-MPG-101/00 and FMFI.KAGDM/2-MPG-102/00

Course requirements:
Attend lessons. One missed +0 points. 2 missed 0 points, 3 missed 0 points, 4 and more is Fx.
Project and exercise (mandatory).
Solve all homework problems (mandatory each one >=30%)
Pass final term (mandatory) You will need to solve several problems discussed during lessons.
Pass oral/written exam: (mandatory)
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
After completing the course students will know techniques of photorealistic computer graphics. Will be able to solve color calculation, shadow computation and render views of a scene from the input images. Students learn the basics of graphical programming in C #.

Class syllabus:
LECTURE01 "INTRODUCTION TO COMPUTER GRAPHICS"
LECTURE02 "RAY TRACING 1."
TayTracong Pipeline
LECTURE03 "RAY TRACING 2."
Ray Intersections
LECTURE04 "RAY TRACING 3."
Ray Tracing Acceleration, Data structure: grids, BVH, Kd-tree, Directional Partitioning, Dynamic Scenes, Beam and Cone Tracing, Packet Tracing
LECTURE05 "LIGHT TRASPORT."
Physics behind ray tracing, Physical light quantities, Visual perception of light, Light sources, Light transport simulation: Rendering Equation
LECTURE06 "RADIOSITY."
Diffuse reflectance function, Radiative equilibrium between emission and absorption, escape, System of linear equations, Iterative solution Neuman series
LECTURE07 "BRDF."
Bidirectional Reflectance Distribution Function (BRDF), Reflection models, Projection onto spherical basis functions, Shading Phong model, Blin-Phong model

Physical BRDF, Ward Reflection Model, Cook-Torrance model
LECTURE08 "SHADOWS."
LECTURE09 "TEXTURING 1, 2."
Texture parameterization, Procedural methods, Procedural textures, Fractal landscapes, Surface reality techniques
LECTURE10 "IMAGE BASED RENDERING 1."
Plenopticfunction, Panoramas, Concentric Mosaics, Light Field Rendering, The Lumigraph
LECTURE11 "IMAGE BASED RENDERING 2."
Layered Depth Images, View-dependent Texture Mapping, Surface Light Fields, View Morphing
LECTURE12 "ASK ME ANYTHING."
Test problem introduction

Recommended literature:
Moderní počítačová grafika / Jiří Žára ... [et al.]. Brno : Computer Press, 2010
Realistic image synthesis using photon mapping / Henrik Wann Jensen ; Foreword by Pat Hanrahan. Natick : A K Peters, 2001
http://www.sccg.sk/~durikovic/classes/CG2/cg2_syllabus.html

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 4

A	B	C	D	E	FX
0,0	25,0	75,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-112/15	Advanced Image Processing

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
homeworks, projects, written exam
A 91%, B 82%, C 73%, D 64%, E 55%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Graduates will know the advanced image processing techniques, such as image transformation, filtering, image improvement, advanced segmentation techniques (using active contours - snakes, flood segmentation) etc.

Class syllabus:
Image capture.
Features digital image.
Picture transformation
Methods of image preprocessing, Hough transform
Fourier Transform - DFT, FFT, filters detail
noise Reduction
Mathematical Morphology BW and grayscale
Segmentation. Snake watershed, clustering
improving the image
processing textures

Recommended literature:
Image processing, analysis, and machine vision / Milan Sonka, Vaclav Hlavac, Roger Boyle. [Stamford] : Cengage Learning, 2008
Digital image processing / Rafael C. Gonzalez, Richard E. Woods. Beijing : Pearson education Asia : Publishing House of Electronics Industry, 2010
Image processing : The fundamentals / Maria Petrou, Costas Petrou. Chichester : John Wiley, 2010

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 32					
A	B	C	D	E	FX
6,25	28,13	43,75	9,38	3,13	9,38
Lecturers: RNDr. Zuzana Černeková, PhD., RNDr. Paula Budzáková					
Last change: 22.09.2017					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-131/14	Advanced programming in JAVA (JavaEE)

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Recommended prerequisites:
1-AIN-172 Programovanie (4)

Course requirements:
exercise mini projects, project
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students will well oriented in advanced technologies Java and JavaEE: Reflection model, XML processing, programming, network applications, access to relational databases, mail, security, JSP, Servlets, object-relational mapping, web applications in Java.

Class syllabus:
- Reflection model
- The use of XML technology
- Network client / server
- Work with relational databases from Java
- Servlets and JSP
- Object-relational mapping
- Web Applications in Java

Recommended literature:
Java EE 6 with GlassFish 3 application server : A practical guide to install and configure the GlassFish 3 application server and develop Java EE 6 applications to be deployed to this server / David Heffelfinger. Birmingham : Packt Publishing, 2010
Java a XML / Pavel Herout. České Budějovice : KOPP, 2007
Sun Certified Enterprise Architect for Java EE study guide / Mark Cade, Humphrey Sheil. Upper Saddle River : Prentice Hall, 2010

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 38

A	B	C	D	E	FX
15,79	18,42	15,79	21,05	26,32	2,63

Lecturers: Mgr. Pavel Petrovič, PhD., RNDr. Peter Borovanský, PhD., doc. RNDr. Zuzana Kubincová, PhD.

Last change: 24.10.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KI/2-AIN-205/15	Algorithmics for Hard Problems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Recommended prerequisites:
1-AIN-105 Efektívne algoritmy a zložitosť OR 1-INF-310 Tvorba efektívnych algoritmov

Course requirements:
homeworks, quizzes, written exams
Scale: A 90%, B 80%, C 70%, D 60%, E 50
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
After completing this subject students will be able to use the methods to solve difficult algorithmic task, particularly approximation algorithms, probability algorithms and integer linear programming. Students will be able to work with extended methods of analysis algorithms and complexity classes.

Class syllabus:
Introduction to approximation algorithms. Neaproximovateľnosti term. Probabilistic analysis of algorithms and their complexity. Las Vegas and Monte Carlo. Integer linear programming. Overview of a hierarchy of complexity classes. Demonstrations on examples.

Recommended literature:
Introduction to algorithms / Thomas H. Cormen ... [et al.]. Cambridge, Mass. : MIT Press, 2001
Approximation algorithms / Vijay V. Vazirani. Berlin : Springer, 2001
Randomized algorithms / Rajeev Motwani, Prabhakar Raghavan. New York : Cambridge University Press, 1995

Languages necessary to complete the course:
slovensky, anglicky

Notes:

Past grade distribution
Total number of evaluated students: 16

A	B	C	D	E	FX
18,75	18,75	6,25	37,5	18,75	0,0

Lecturers: doc. RNDr. Dana Pardubská, CSc., doc. Mgr. Tomáš Vinař, PhD., RNDr. Jozef Šiška, PhD.
Last change: 22.09.2017
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-235/15	Algorithms of Artificial Intelligence in Robotics

Educational activities:
Type of activities: lecture / laboratory practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:
exercises, project, and final test
A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will understand methods of Artificial Intelligence that are useful for intelligent robotic systems. They will have a practical hands-on experience with programming real and simulated robotic intelligent systems.

Class syllabus:
Perception and sensor systems, software robotic architectures, space representation and inference, navigation and localization, probabilistic approaches, simulation, artificial life evolutionary algorithms and neural networks in robotics, applications.

Recommended literature:
The robotics primer / Maja J. Matarić. Cambridge, Mass. : MIT Press, 2007
Invitation to topological robotics / Michael Farber. Zürich : European Mathematical Society, 2008

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
10,0	20,0	60,0	10,0	0,0	0,0

Lecturers: Mgr. Pavel Petrovič, PhD.

Last change: 24.10.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-253/15	Answer Set Programming

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites: FMFI.KAI/2-AIN-108/15 - Computational Logic

Antirequisites: FMFI.KAI/1-AIN-617/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

A	B	C	D	E	FX
50,0	0,0	50,0	0,0	0,0	0,0

Lecturers: Ing. Alexander Šimko, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-137/15	Artificial Intelligence

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
projects, written exam
Scale: A 95%, B 88%, C 79%, D 68%, E 55%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
After completing the course, students should have a good overview of the theoretical methods used in artificial intelligence. They should be able to use these methods in practice in programming intelligent systems, they should be able to enrich and creatively exploit.

Class syllabus:
1. Agents, types of agents, agent properties. Browse - informed strategies. 2. Search - informed strategies. Games. 3. Logical agents, propositional and predicate database knowledge. 4. Inference of the predicate in the knowledge base. 5. Planning. 6. likelihood naive Bayesian classifier, Bayesian network. 7. Bayesian network, exact and approximate inference in Bayesian network. 8. Using Bayesian networks in artificial intelligence. Introduction to the use of probability theory in games. 9. Monte Carlo method in games.
10. The classic theory of time series, time series models. 11. Use of Bayesian networks inference in time series with uncertainty. 12. Markov priocesy, Kalman filter, the use of artificial intelligence. 13. Decision Theory: simple and complex decision-making, decision trees.

Recommended literature:
Artificial intelligence : A modern approach / Stuart J. Russell, Peter Norvig. Englewood Cliffs : Prentice-Hall, 1995
Artificial intelligence a new synthesis / Nils J. Nilsson. San Francisco : Morgan Kaufmann, 1998

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 39

A	B	C	D	E	FX
35,9	15,38	15,38	15,38	15,38	2,56

Lecturers: doc. RNDr. Mária Markošová, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-MPG-246/15	Colour Image Processing

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAI/2-AIN-273/11

Course requirements:
E at least 50%

Learning outcomes:
After completing the subject, the student will master advanced techniques of the colour-image processing.

Class syllabus:
Light and colour, the human visual system.
Colour image quantization, determination of the palette.
Colour morphology.
Finding of corners, filtering of colour images.
Segmentation and its use.
Colour -to-grayscale and vice versa conversions.
Colour stability, shadow removal.
Mapping of the colour range.
Colour models.

Recommended literature:
Color in computer vision : Fundamentals and applications / Theo Gevers ... [et al.]. Hoboken : Wiley, 2012
Digital color image processing / Andreas Koschan, Mongi Abidi. Hoboken, N.J. : Wiley, 2008
Elena Šikudová, Zuzana Černeková, Vanda Benešová, Zuzana Haladová, Júlia Kučerová: Počítačové videnie. Detekcia a rozpoznávanie objektov, vydavateľstvo Wikina, Praha, ISBN: 978-80-87925-06-5

Languages necessary to complete the course:
Slovak and English

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Zuzana Černeková, PhD.

Last change: 03.09.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI+KZVI/2-AIN-139/14	**Course title:** Compilers and interpreters
Educational activities: **Type of activities:** lecture / practicals **Number of hours:** **per week:** 2 / 2 **per level/semester:** 28 / 28 **Form of the course:** on-site learning	
Number of credits: 6	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: tests, practical exam Scale: A 85%, B 79%, C 72%, D 66%, E 60% Scale of assessment (preliminary/final): 40/60	
Learning outcomes: After completing the course student is able to analyze, evaluate and programming language design and compiler or interpreter to create a simple programming language.	
Class syllabus: Introduction to programming languages, compilers and interpreters Virtual machine, code, memory management Abstract syntax trees and other representations Lexical analysis Parsing Namespaces Algorithms for compiling language constructs, data structures and expressions Code Generation Error Handling	
Recommended literature: Compilers : Principles, techniques, & tools / Alfred V. Aho ... [et al.]. Boston : Pearson/Addison-Wesley, 2007 Programming language pragmatics / Michael L. Scott. Amsterdam ; Boston : Elsevier/Morgan Kaufmann Pub.,, 2009 Salanci, L.: www.salanci.sk - stránka s prednáškami a cvičeniami	
Languages necessary to complete the course:	
Notes:	

Past grade distribution
Total number of evaluated students: 100

A	B	C	D	E	FX
27,0	17,0	17,0	13,0	19,0	7,0

Lecturers: doc. RNDr. Ľubomír Salanci, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-154/12	Complex Networks

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 70/30

Learning outcomes:

Class syllabus:
1. Case studies (internet, social networks, functional brain networks..). Náther
2. Graph theory and complex networks. Markošová
3. Lattice and random networks (clustering, shortest distance, centrality....), Eordes, Renyiho theory. Markošová
4. Small world networks – models, navigation on nets, case study. Čajági
5. Scale free networks 1 – Barabási – Albert model, preferential node attachment, case study, variants of BA model. Náther
6. Tools for network analysis (NWB, Navigator). Čajági
7. Scale free networks 2 - Vasquezo model, surfers na network. Markošová
8. Hierarchy in networks, Ravasz Barabasi model, surfers on networks and hierarchy, case study. Náther
9. Socal networks, collaboration networks, cfommunities, clusters, models. Čajági
10. Epidemic networks, netwrks witch synchronicity. Čajági
11. Vizualization of networks, tools, layouts. Náther
12. Vulnerability, stability of nets, risk analysis. Čajági
13. Applications of the complex networks theory (in computer science informatike, biology, sociology, linguisics...). Markošová
14. Student projects. Náther

Recommended literature:
D. J. Watts, Small worlds, Princeton university press, Princeton USA, 2004
M.E.J. Newman, The Structure and Function of Complex Networks, SIAM Review 2003
A. Barat, M. Barthelemy, A. Vespigniani, Dynamical Processes on Complex Networks, Cambridge University Press New York, 2008, ISBN 0521879507

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 27					
A	B	C	D	E	FX
29,63	44,44	18,52	7,41	0,0	0,0
Lecturers: doc. RNDr. Mária Markošová, PhD.					
Last change: 02.06.2015					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-108/15	Computational Logic

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
The course gives the foundation of computer logic needed for further study of knowledge representation and artificial intelligence. Listeners will be familiar with ontology and logick programming. The course focuses on the following aspects of the representation (syntax, semantics, resulting), but the main emphasis is on algorithmic aspects (resulting calculation, its accuracy and computational complexity).

Class syllabus:
- First order predicate logic (repeat)
- Description Logics (syntax, semantics, inference algorithm)
- Use of description logic (ontology and database)
- Logic Programming (syntax, minimal models, stratification, stable models, well-established models, SLDNF rezolvencia, calculation of stable models)
- Use logic programs (Prolog, ASP programming)

Recommended literature:
The description logic handbook : Theory, implementation, and applications / Edited Franz Baader ... [et al.]. Cambridge : Cambridge University Press, 2005
Handbook of knowledge representation / edited by Frank van Harmelen, Vladimir Lifschitz, Bruce Porter. Amsterdam : Elsevier, 2008
Inteligencia ako výpočet / Ján Šefránek. Bratislava : Iris, 2000

Languages necessary to complete the course:
slovensky, anglicky

Notes:

Past grade distribution Total number of evaluated students: 50					
A	B	C	D	E	FX
10,0	4,0	20,0	16,0	22,0	28,0
Lecturers: RNDr. Martin Homola, PhD., Mgr. Júlia Pukancová					
Last change: 22.09.2017					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-222/00	Computer Graphics Aplications

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
presentations, quiz
A 92%, B 84%, C 76%, D 68%, E 60
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Students will have knowledge of successful design projects and new trends in the application of methods and means of computer graphics.

Class syllabus:
1. Project presentations according to the project report distributed to the students
2. Projects and results done at the department
3. New trends and applications of computer graphics techniques.

Recommended literature:
J. Žára, B. Beneš, P. Felkel, Moderní počítačová grafika, Computer Press, Praha 1998
Project report in journal IEEE Computer and Graphics Applications
Internet

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 166

A	B	C	D	E	FX
53,01	13,86	17,47	6,63	5,42	3,61

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KAGDM/2-MPG-125/15	Computer Vision

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Assessment: evaluation
Preliminary assessment: Continuous assessment projects
Final assessment: assessment examination 60% (A 90%; B 80%; C 70%; D 60%; E 50%)
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Graduates will know the advance techniques of machine vision, image recognition and processing, such as feature extraction from images, face detection and tracking, identification of significant areas in the image, etc.

Class syllabus:
Features (low and medium, global, local), extraction.
A selection from the database DB.
Detection, face tracking.
Color gamut mapping.
HDR.
Eye movement tracking.
Significant areas in the image.
Image quality.

Recommended literature:
Feature extraction : Foundations and applications / Isabelle Guyon ... [et al.] (eds.). Berlin : Springer, 2006
Algorithms for image processing and computer vision / J. R. Parker. New York : Wiley, 1997
Shape classification and analysis : Theory and practice / Luciano da Fontoura Costa, Roberto Marcondes Cesar, Jr.. Boca Raton, Fla. : CRC Press, 2009
Elena Šikudová, Zuzana Černeková, Vanda Benešová, Zuzana Haladová, Júlia Kučerová: Počítačové videnie. Detekcia a rozpoznávanie objektov, vydavateľstvo Wikina, Praha, ISBN: 978-80-87925-06-5

Languages necessary to complete the course:

Slovak and English

Notes:

Past grade distribution
Total number of evaluated students: 46

A	B	C	D	E	FX
13,04	10,87	23,91	23,91	10,87	17,39

Lecturers: Mgr. Ľudovít Balko, PhD., RNDr. Zuzana Berger Haladová, PhD.

Last change: 14.01.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-233/00	**Course title:** Computer Vision Applications
Educational activities: **Type of activities:** seminar **Number of hours:** **per week:** 2 **per level/semester:** 28 **Form of the course:** on-site learning	
Number of credits: 3	
Recommended semester: 3.	
Educational level: II.	
Prerequisites:	
Recommended prerequisites: 2-AIN-112/15 or 2-MPG-125/15	
Course requirements: Presentations A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: After completing the course students will be able to discover, develop and analyze the latest practices of successful projects in the field of computer vision and apply new trends in computer vision to create their own applications.	
Class syllabus: 1. Case studies of successful applications. 2. Industrial applications. 3. Medical applications. 3. Other applications. 4. Results of departmental research projects. 5. New trends in application of computer vision methods and techniques.	
Recommended literature: Boyle – Šonka – Hlaváč: Image processing, analysis and machine vision, 1999 Research reports ECCV proceedings Internet	
Languages necessary to complete the course:	
Notes:	

Past grade distribution Total number of evaluated students: 152					
A	B	C	D	E	FX
48,03	25,0	9,87	1,97	4,61	10,53
Lecturers: RNDr. Zuzana Černeková, PhD.					
Last change: 23.09.2017					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-145/15	Creating Internet Applications

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:
Project, written and oral exam with practical component
Approximate grading scale: A 91%, B 81%, C 72%, D 63%, E 56%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Students will be able to implement internet applications using selected modern technologies, software engineering practices and complex application framework.

Class syllabus:
Selected current technologies: client-side scripting, raster and vector client-side graphics rendering, two-way communication between the server and the client. Selected software-engineering practices: MVC design pattern, separation of presentation and content, testing. Complex application framework including user identification and authentication, access control, object-relational mapping, templates, navigation. Security of internet applications.

Recommended literature:
JavaScript profesionálně / Steven Holzner ; překlad Jan Gregor ... [et al.]. Praha : Mobil Media, 2003
CSS kaskádové styly pro webdesignéry / Marek Prokop. Brno : CP Books, 2005

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 90

A	B	C	D	E	FX
22,22	12,22	28,89	21,11	14,44	1,11

Lecturers: RNDr. Richard Ostertág, PhD., RNDr. Jana Katreniaková, PhD.

Last change: 18.10.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KZVI/2-AIN-136/15	Creation of Educational Software

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites: FMFI.KZVI/2-AIN-115/15 - Software for Education

Course requirements:
evaluation of stage: design, develepment and testing the educational software
oral exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Student, teacher according to the requirements of practice, designs and develops educational software. Its development work in a team with one or two colleagues. Program design and test control in four stages. The result of the last stage of the operational program. Software develops methods action research (Design-Based Research). Student wrote a user manual for teachers.

Class syllabus:
Cooperation between the teacher (the sponsor) and educational software programmer, UML as their communication tool. Requirements for educational software to teach specific topics for elementary, secondary or university - interactivity, multimedia, open software (settings, tasks, pictures, editor for teachers, students logging, tables and charts of pupil assessment ...). Software development in four stages. Evaluation software from the perspective of teachers and pupils - software development methods action research. Vs. desktop programs Web applications in the development and use of educational software. Platform independence educational software, educational software mobile version.

Recommended literature:
UML a unifikovaný proces vývoje aplikací : Průvodce analýzou a návrhem objektově orientovaného softwaru / Jim Arlow, Ila Neustadt ; přeložil Bogdan Kiszka. Brno : CP Books, 2005
vlastné elektronické texty zverejňované na webovej stránke, resp. v prostredí Moodle

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 30					
A	B	C	D	E	FX
53,33	3,33	26,67	13,33	3,33	0,0
Lecturers: doc. PaedDr. Monika Tomcsányiová, PhD., Mgr. Karolína Mayerová, PhD.					
Last change: 22.09.2017					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KZVI/2-AIN-225/15	Creation of Multimedia Applications and Computer Games

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
homeworks
practical exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
After completing the course student is able to analyze, evaluate, design and create multimedia applications.

Class syllabus:
Introduction to the creation of multimedia and interactive applications and computer games.
Tools for creating multimedia and interactive applications and computer games.
Algorithms for processing text, images, audio and video in real time.
The algorithms for real-time interaction.
Algorithms for timing and mixing media.
Multimedia in various fields of human activities (school, medicine, art, ...).

Recommended literature:
3D game engine design : A practical approach to Real-Time computer graphics / David H. Eberly. Amsterdam : Elsevier, 2007

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 93

A	B	C	D	E	FX
22,58	15,05	15,05	23,66	17,2	6,45

Lecturers: doc. RNDr. Ľubomír Salanci, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KI/2-INF-188/17	Current Approaches in Machine Learning

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Mgr. Vladimír Boža, PhD.

Last change: 12.01.2018

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-291/15	Data Warehousing

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
sufficient points earned during the semester
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The students will have an overview about the field of Data Warehousing, and its subareas. They will have a complex understanding of the area. Students will gain a theoretical knowledge in the area of the design of Data Warehouses, ETL processes, and report creation. While working with the tools of contemporary data warehousing industrial design practice, the students will obtain practical skills.

Class syllabus:
- Introduction to the field of Data Warehousing
- The most common types of SQL queries used in the context of data warehouses
- Principles, methods, and specifics of dimensional modeling and the differences from a relational modeling
- Designing logical and physical models using a modeling tool
- Using physical database structures and special methods (partitions, indexes, star transformations)
- Introduction to the DataStage tool
- Working with metadata
- Using data resources (database connections, files, etc.)
- Parallel and sequential jobs
- Partitions in the context of ETL processes
- Methods for data processing with ETL processes (transformations, aggregations, join, merge, lookup, sorting, duplicates removal, etc.)
- Design patterns (Slowly changing dimensions)
- Methods used in ETL processes design
- Data lineage
- Design of ETL processes
- Creating reports
- Principles and design of mutidimensional models (Cubes)
- Overview of advanced methods for data processing in data warehouses: Predictive analysis tools (SPSS), cognitive tools (Watson)

Recommended literature:

Christopher Adamson, The Star Schema, Complete Reference, 510p., McGraw-Hill Osborne Media; 1 edition (July 7, 2010), ISBN: 978-0071744324

Ralph Kimball, The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling , Wiley; 2 edition (April 26, 2002), ISBN: 978-0471200246

IBM Redbooks, IBM Infosphere Datastage Data Flow and Job Design, 616p. Vervante (July 7, 2008), ISBN: 978-0738431116

Languages necessary to complete the course:

Notes:

Past grade distribution

Total number of evaluated students: 10

A	B	C	D	E	FX
80,0	10,0	10,0	0,0	0,0	0,0

Lecturers: Mgr. Radoslav Golian, PhD.

Last change: 24.10.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-266/17	Declarative Programming

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:
Preliminary assessment: homeworks, tests.
Scale: A 90%, B 80%, C 70%, D 60%, E 50%.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
To give mathematical foundations of declarative programming languages.

Class syllabus:
1. Primitive Recursive Functions. Basic functions and operations. Explicit definitions. Bounded minimalization. Pairing function and arithmetization. Recursion with substitution in parameters. Nested simple recursion. Recursion with measure. Regular recursive definitions.
2. General Recursive Functions. Beyond primitive recursion: Ackermann-Péter function, universal function for primitive recursive functions. Primitive recursive indices. Transfinite recursion. General recursive functions. Regular minimalization. μ-Recursive functions.
3. Partial Recursive Functions. First recursion theorem (fixed point theorem). Computation model. Equivalence of the operational and denotational semantics. Partial recursive functions. Unbounded minimalization. Arithmetization of computation. Kleene normal-form theorem. Universal function. Recursive indices. Enumeration theorem. Partial μ-recursive functions. Church thesis. Recursively decidable, semidecidable and undecidable problems.

Recommended literature:
[1] Recursive Functions / Ján Komara. Online.
[2] Úvod do teórie algoritmov / Ivan Korec. Bratislava : Univerzita Komenského, 1983.

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Ing. Ján Komara, PhD.

Last change: 04.05.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-283/00	Development of Critical Applications

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The course is a continuation of the course Formal Methods of Software Development where students learn some basic models exploited in formal specifications of systems (Process Algebras, Petri nets, Timed Automata ..). In this lecture we will focus on applications of the previously presented models and technique in design of critical applications.

Recommended literature:
Milner, R.: Communication and concurrency. Prentice-Hall
International, New York, 1989.
Reisig, W.: A Primer in Petri Net Design. Springer-Verlag, 1992
Jan A. Bergstra, Alban Ponse, and Scott A. Smolka, Editors. Handbook of Process Algebra, Elsevier, 2001.
Stirling C.: Modal and Temporal Properties of Processes, Springer (Texts in Computer Science), 2001

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 20

A	B	C	D	E	FX
90,0	5,0	5,0	0,0	0,0	0,0

Lecturers: doc. RNDr. Damas Gruska, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-272/15	Digital Image Processing

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
homeworks,
practical exam, written exam, oral exam
Scale: A 88%, B 81%, C 74%, D 67%, E 60%

Learning outcomes:
Students acquire theoretical and practical knowledge with the processing of discrete (sampling analog) one dimensional signals using a computer. The acquired knowledge can be used in real-world applications such as audio processing, measurement sensors, signal transmission ... In the exercises students gain the appropriate skills to work in an environment Octave (freely distributable compatible alternative to Matlab).

Class syllabus:
discrete-time signal
Discrete random signal
Discrete Fourier Transform (DFT)
Okienkový functions and their influence on the properties of the DFT
Z-transformation
Discrete linear time-invariant (LTI) systems
Digital IIR filters
Digital FIR filters
Detection and estimation
Power Spectral Density (PSD)
parametric PSD

Recommended literature:
Springer handbook of speech processing / Jacob Benesty, M. Mohan Sondhi, Yiteng Huang (Eds.). Berlin : Springer, 2008
Číslicová filtrace, analýza a restaurace signálů / Jiří Jan. Brno : Vysoké české učení : VUTIUM, 2002

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 62

A	B	C	D	E	FX
24,19	17,74	9,68	12,9	24,19	11,29

Lecturers: RNDr. Marek Nagy, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-991/15	**Course title:** Diploma Thesis
Number of credits: 16	
Educational level: II.	
Prerequisites: FMFI.KAI/2-AIN-923/15 - Project Seminar (1) and FMFI.KAI/2-AIN-924/15 - Project Seminar (2)	
State exam syllabus:	
Last change: 23.09.2017	
Approved by: prof. RNDr. Roman Ďurikovič, PhD.	

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KAGDM/2-AIN-138/16	Discrete Structures in Informatics and Computer Graphics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 12

A	B	C	D	E	FX
8,33	16,67	16,67	16,67	33,33	8,33

Lecturers: doc. RNDr. Tatiana Jajcayová, PhD., doc. RNDr. Róbert Jajcay, DrSc.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KZVI/2-AIN-234/15	E-learning Environments in Education

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites: FMFI.KZVI/2-AIN-136/15 - Creation of Educational Software

Recommended prerequisites:
2-AIN-224 Webové programovanie AND 2-AIN-136 Tvorba edukačného softvéru

Course requirements:
homeworks, project
practical exam
Scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The student is able with respect to the specified educational requirements a) assess the various e-learning environments, b) specifies the requirements for e-learning environment, c) select the appropriate e-learning environment, respectively. suggest new environment or a new module into the existing environment.

Class syllabus:
Overview, comparing, assessing and analyzing various e-learning environments, and systems for learning objects (learning objects).
Creation of requirements specifications for the learning environment.

Recommended literature:
Web- based training : Creating e-Learning experiences / Margaret Driscoll. San Francisco : Jossey-Bass , 2002
Vlastné elektronické texty vyučujúceho predmetu zverejňované prostredníctvom web stránky predmetu, resp. systému Moodle.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 10

A	B	C	D	E	FX
50,0	20,0	30,0	0,0	0,0	0,0

Lecturers: PaedDr. Roman Hrušecký, PhD., doc. RNDr. Zuzana Kubincová, PhD.
Last change: 23.09.2017
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-233/13	English Conversation Course (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1., 3.

Educational level: I., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
The content of the course is general English.
The language level is B2/C1 (Upper-Intermediate/Lower Advanced).

Recommended literature:
Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals
Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 135

A	B	C	D	E	FX
58,52	18,52	9,63	2,22	1,48	9,63

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-234/13	English Conversation Course (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2., 4.

Educational level: I., II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:

Class syllabus:
The course is a follow-up to the Conversation Course in English (1). The content of the course is general English.
The language level is B2/C1 (Upper-Intermediate/Lower Advanced).

Recommended literature:
Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals
Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 62

A	B	C	D	E	FX
67,74	19,35	4,84	0,0	0,0	8,06

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-181/00	Evolutionary Algorithms

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 61

A	B	C	D	E	FX
27,87	19,67	26,23	14,75	6,56	4,92

Lecturers: doc. RNDr. Mária Markošová, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-133/15	Extreme Programming

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Recommended prerequisites:
1-AIN-171 Programmiong (3)

Antirequisites: FMFI.KAI/1-AIN-680/00

Course requirements:
Continuous assessment: work in exercises, ongoing transmission and delivery of assigned tasks
Test: test at the computer, an interview, project development
Approximate evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
After completing the course, students will be able to use the methods and techniques Agile Extreme Programming methodology. It will be the pair programming, different techniques of use and test, test driven programming, refactoring, techniques of working with legacy code. They will be able to organize work on a collective project by project management methodology in the form of extreme programming.

Class syllabus:
A brief history of software engineering life cycle of software systems, the traditional methodology and agile methodologies, the main pillars of extreme programming, pair programming, test of controlled programming, typology of different kinds of tests and their use, refactoring and its methodology and techniques, working with legacy code, four variables project management, strategy solutions - planning, development, design, testing, design and creation of custom group project.

Recommended literature:
Čistý kód / Robert C. Martin ; překlad Jiří Berka. Brno : Computer Press, 2009
Refactoring : Improving the design of existing code / Martin Fowler. Boston : Addison-Wesley, 1999
Agilní programování : Metodiky efektivního vývoje softwaru / Václav Kadlec. Brno : Computer Press, 2004
electronic documents

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 74

A	B	C	D	E	FX
68,92	12,16	10,81	2,7	2,7	2,7

Lecturers: Ing. František Gyarfaš, CSc.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-185/00	Formal Methods of Software Development

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 42 / 14
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
exercises, exams
90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Graduates of this subject will know the basic models, the formalisms and techniques used in formal specification and verification of methods.

Class syllabus:
Students will learn some basic models exploited in formal specifications of systems (Process Algebras, Petri nets, Timed Automata ..), their syntax and semantics which are suitable for different applications in formal specifications. Also some modal and temporal logics which are exploited in systems specifications will be tought together with some basics on model checking.

Recommended literature:
Milner, R.: Communication and concurrency. Prentice-Hall
International, New York, 1989.
Reisig, W.: A Primer in Petri Net Design. Springer-Verlag, 1992
Jan A. Bergstra, Alban Ponse, and Scott A. Smolka, Editors. Handbook of Process Algebra, Elsevier, 2001.
Stirling C.: Modal and Temporal Properties of Processes, Springer (Texts in Computer Science), 2001

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 350

A	B	C	D	E	FX
14,29	10,57	19,43	30,29	24,29	1,14

Lecturers: doc. RNDr. Damas Gruska, PhD.

Last change: 14.01.2016
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-141/00	French Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
French language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of French.

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 374

A	B	C	D	E	FX
39,84	22,19	21,66	10,16	2,14	4,01

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-142/00	French Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of French language (1) and provides courses of essential and intermediate French language.

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2
Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983
Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 237

A	B	C	D	E	FX
34,18	27,85	21,52	11,39	2,53	2,53

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-241/00	French Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject provides a course of intermediate French language, covering not only general, but also technical language.

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2
Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983
Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 93

A	B	C	D	E	FX
33,33	30,11	23,66	7,53	1,08	4,3

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-242/00	French Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject provides a course of intermediate French covering not only general, but also technical French language.

Recommended literature:
Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2
Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983
Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008
Zarha Lahmidi: Sciences-techniques.com, ISBN 209-0331186-0, CLE international, 2005

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 63

A	B	C	D	E	FX
31,75	38,1	20,63	3,17	1,59	4,76

Lecturers: Mgr. Pavel Vilášek, Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-116/14	**Course title:** Functional Programming
Educational activities: **Type of activities:** lecture / practicals **Number of hours:** **per week:** 2 / 2 **per level/semester:** 28 / 28 **Form of the course:** on-site learning	
Number of credits: 6	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Recommended prerequisites: 1-AIN-430 Programovacie paradigmy	
Course requirements: homeworks, written exam Scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 70/30	
Learning outcomes: students will know what is functional programming, basics of lambda calculus and advanced technology functional programming	
Class syllabus: Functional pearls The transformation of functional programs Functional morphisms a scheme recursion Introduction to the lambda calculus Properties lambda theory Interpreter lambda calculus typing systems logic Kombinator parsing Monadic parsers monads	
Recommended literature: Functional programming : practice and theory / Bruce J. MacLennan. Reading : Addison-Wesley, 1989 Haskell the craft of functional programming / Simon Thompson. Harlow : Pearson, 1999 Abstract computing machines : A lambda calculus perspective / W. Kluge. Berlin : Springer, 2005	
Languages necessary to complete the course:	

Notes:

Past grade distribution
Total number of evaluated students: 29

A	B	C	D	E	FX
51,72	6,9	34,48	6,9	0,0	0,0

Lecturers: RNDr. Peter Borovanský, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-254/15	Fuzzy Inference and Expert Systems

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites:

Recommended prerequisites:
2-AIN-287 Znalostné systémy

Course requirements:
Tests:
Approximate evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Theoretical and practical fundamentals of fuzzy logic, inference and expert systems

Class syllabus:
- Uncertainty and its formalization (triangular (co) standard connection.
- Many valued (fuzzy) logic (Lukasiewicz, Goedel, product).
- Fuzzy Sets.
- Fuzzy numbers and arithmetic.
- Modifiers fuzzy sets (Hedges).
- Fuzzy Reasoning, compositional rule of inference (CRI)
- Fuzzy rules - Mamdani-ho type.
- Fuzzy rules - Takagi-Sugeno-ho type.
- Linguistic variable Zadeh approach.
- Fuzzification.
- Defuzzification.
- Fuzzy inference systems.
- Fuzzy expert systems.

Recommended literature:
Fuzzy množiny a jejich aplikace / Vilém Novák. Praha : Státní nakladatelství technické literatury, 1986
http://ii.fmph.uniba.sk/~guller/Synlogy.pdf

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 5

A	B	C	D	E	FX
40,0	20,0	20,0	20,0	0,0	0,0

Lecturers: doc. RNDr. Dušan Guller, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-134/14	**Course title:** Geometric modelling in graphics
Educational activities: **Type of activities:** lecture / practicals **Number of hours:** **per week:** 2 / 2 **per level/semester:** 28 / 28 **Form of the course:** on-site learning	
Number of credits: 6	
Recommended semester: 2.	
Educational level: II.	
Prerequisites:	
Course requirements: Projects, oral exam A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: After completing the course, students will be able to distinguish between the current methods and options for creating, modeling and digital representation of three-dimensional objects. He will be able to implement these structures and procedures to use and modify them under the existing modeling tools.	
Class syllabus: 1. Polygonal networks - describes the structure for polygonal representation networks, simplification, smoothing compression and networking, computing over networks (earth, normal, curvature), parameterization and triangularizácia, interactive techniques for modeling networks 2. Parametric curves and surfaces - polynomial and spline representation, design and modeling, tessellation, redistribution curves and surfaces 3. implicit FREP a volumetric representation - classification, modeling, set operations, conversion to the polygonal network 4. point clouds - representation of unorganized set of points, nearest neighbor search set of points, proximity graphs, surface reconstruction, multiview geometry 5. Procedural modeling - L-systems, generating terrain procedurally buildings and cities	
Recommended literature: Curves and Surfaces for computer-Aided geometric design : A practical Guide / Gerald E. Farin. San Diego : Academic Press, 1997	
Languages necessary to complete the course:	
Notes:	

Past grade distribution Total number of evaluated students: 5					
A	B	C	D	E	FX
0,0	20,0	40,0	20,0	0,0	20,0
Lecturers: prof. RNDr. Roman Ďurikovič, PhD.					
Last change: 22.09.2017					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-151/00	German Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
German language is taught at three levels: beginner, intermediate and advanced. Students opt for one of them depending on whether they need to learn the fundamentals or maintain and/or improve their previous knowledge.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 648

A	B	C	D	E	FX
31,94	29,17	21,3	10,03	2,93	4,63

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-152/00	German Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The course continues the program of German language (1). German language is taught at three levels: beginner, intermediate, advanced.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 408

A	B	C	D	E	FX
29,17	22,06	23,77	14,95	3,68	6,37

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-251/00	German Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of German language (2). It provides a course of intermediate and advanced German language.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.
Aus moderner Technik und Naturwissenschaft, 1999, Max Hueber Verlag, D-85737, ISBN 3-19-001629-1

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 148

A	B	C	D	E	FX
38,51	27,03	22,3	6,76	2,7	2,7

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-252/00	German Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of German language (3). It provides a course of intermediate and advanced German language.

Recommended literature:
Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.
Vilma Václavíková: Nemčina pre študentov MFF UK, Vysokoškolský učebný text pre potrebu študentov KJP, č. 9793/1982 C VIII/2, 1983

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 78

A	B	C	D	E	FX
35,9	28,21	14,1	12,82	3,85	5,13

Lecturers: Mgr. Pavel Vilášek, Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-238/15	Graphical Models in Machine Learning

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 4.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAI/2-INF-238/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 9

A	B	C	D	E	FX
55,56	22,22	11,11	0,0	11,11	0,0

Lecturers: doc. Mgr. Tomáš Vinař, PhD.

Last change: 18.02.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-129/15	Informatics - Generic Subject

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 6

A	B	C	D	E	FX
33,33	33,33	33,33	0,0	0,0	0,0

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-101/15	**Course title:** Information Systems - Generic Subject
Educational activities: **Type of activities:** **Number of hours:** **per week: per level/semester:** **Form of the course:** on-site learning	
Number of credits: 6	
Recommended semester: 1.	
Educational level: II.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	

Past grade distribution
Total number of evaluated students: 8

A	B	C	D	E	FX
25,0	37,5	12,5	25,0	0,0	0,0

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.
Last change: 02.06.2015
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KZVI/2-AIN-117/15	Interactive Programming

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
tests, bonus homeworks,
practical exam, project defence
Scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
The student will acquire programming experience with the new Programming Paradigms - symbolic programming in an interpreted language, which uses object-oriented programming, events, parallel processes and multiple objects, but in the context of school science, educational programming and the development of interactive learning programs - of microworld. The student will learn how to design and develop small teaching the microworld for interactive, visual modeling and Constructivism (learning by discovery and investigation) for primary and secondary school.

Class syllabus:
Korytnačia geometria a korytnačí modul v jazyku Python ako nástroj na modelovanie a skúmanie geometrických vizuálnych štruktúr. Kolónie objektov. Algoritmické problémy súvisiace s takýmto modelovaním. Skúmanie abstraktných výtvarných diel 20. storočia prostriedkami moderného symbolického programovania. Objavujeme farby, farebné modely a farebné prechody objaviteľskými pedagogickými postupmi (s diskusiami o modernej pedagogike a tvorbe softvérových aplikácií na podporu učenia sa žiakov a študentov všetkých stupňov vzdelávania). Vzory, dlaždice, repetície a emergentné vizuálne efekty, a s nimi súvisiace algoritmické problémy. Modelovanie stromov. Modelovanie mobilných abstraktných kompozícií pomocou splajnov, rekurzívnych dátových štruktúr a rekurzívnych algoritmov.

Recommended literature:
vlastné elektronické študijné materiály vyučujúceho
bežná študijná literatúra k programovaniu v jazyku Python
Clayson, J.: Visual Eye. Unpublished manuscript, 2015
Clayson, J.: Visual Modeling with Logo. The MIT Press, 1988
Abelson, H., diSessa, A.: Turtle Geometry. The Computer as a Medium for Exploring Mathematics. The MIT Press, 1986
Blaho, A., Kalas, I.: Learning by Developing. Logotron, UK, 1998

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 48

A	B	C	D	E	FX
16,67	14,58	6,25	18,75	31,25	12,5

Lecturers: prof. RNDr. Ivan Kalaš, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-144/15	Knowledge Representation and Reasoning

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites: FMFI.KAI/2-AIN-108/15 - Computational Logic

Course requirements:
mid term test, mid term project evaluation
exam, projects evaluation
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Subject aims to use the knowledge representation formalisms logical to address various practical problems with the help of inference: characteristic reasoning, hypothetical and nonmonotenic reasoning, reasoning about typical cases, reasoning from incomplete and inconsistent knowledge, preferences, induction, abduction, argumentation.

Class syllabus:
- Computational Logic and Reasoning (repeat)
- The characteristics of deductive reasoning (inference)
- Hypothetical Reasoning
- Typical cases
- Incompleteness of knowledge
- Inconsistency Knowledge
- Preferences
- Induction
- Abduction
- Arguments

Recommended literature:
Handbook of knowledge representation / edited by Frank van Harmelen, Vladimir Lifschitz, Bruce Porter. Amsterdam : Elsevier, 2008
Inteligencia ako výpočet / Ján Šefránek. Bratislava : Iris, 2000
Výber aktuálnych článkov z oblasti.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 9

A	B	C	D	E	FX
44,44	33,33	22,22	0,0	0,0	0,0

Lecturers: Mgr. Júlia Pukancová, RNDr. Martin Homola, PhD., Mgr. Júlia Pukancová

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-287/15	Knowledgeable Problem Solving Systems

Educational activities:
Type of activities: course
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAI/2-IKV-234/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: doc. RNDr. Dušan Guller, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-188/15	**Course title:** Life Cycle of Infornation Systems
Educational activities: **Type of activities:** seminar **Number of hours:** **per week:** 2 **per level/semester:** 28 **Form of the course:** on-site learning	
Number of credits: 3	
Recommended semester: 4.	
Educational level: II.	
Prerequisites:	
Course requirements: During semester: submitting of partial work Final grade depends on the project Evaluation based on scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will understand later phases of information systems life cycle - service and support, working with legacy code.	
Class syllabus: 1. Software development life cycle. 2. Relation to information systems development models 3. Deployment 4. Versioning 5. Software maintenance - planning 6. Software maintenance - processes 7. Software maintenance - categorization 8. Customer support – tools and methods 9. Reverse engineering 10. Integration	
Recommended literature: Software engineering : The production of quality software / Shari Lawrence Pfleeger. New York : Macmillan, 1987	
Languages necessary to complete the course:	
Notes:	

Past grade distribution
Total number of evaluated students: 0

A	B	C	D	E	FX
0,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Mgr. Pavel Petrovič, PhD.

Last change: 24.10.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-INF-150/15	Machine Learning

Educational activities:
Type of activities: lecture
Number of hours:
per week: 4 **per level/semester:** 56
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Recommended prerequisites:
(1-INF-115 Algebra (1) OR 1-AIN-152 Linear Algebra) AND 2-INF-175 Probability and Statistics

Course requirements:
homework assignments, project, final exam
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students will be familiar with basic machine learning techniques, and they will be able to use these techniques in practical applications.

Class syllabus:
Supervised machine learning (linear and generalized linear regression, neural networks, classification with support vector machines, kernel methods, discrete classifiers). Machine learning theory (statistical model of machine learning, bias-variance trade-off, overfitting and underfitting, PAC learning, VC dimension estimates). Unsupervised machine learning (clustering, self-organizing maps, principal component analysis). Reinforcement learning. Ensemble learning (bagging, boosting).

Recommended literature:
The elements of statistical learning : Data mining, inference, and prediction / Trevor Hastie, Robert Tibshirani, Jerome Friedman. New York : Springer, 2009
Pattern recognition and machine learning / Christopher M. Bishop. New York : Springer, 2006
Machine learning / T. M. Mitchell. New York : McGraw Hill, 1997
Biological sequence analysis : Probabilistic models of proteins and nucleic acids / Richard Durbin ... [et al.]. Cambridge : Cambridge University Press, 1998

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution Total number of evaluated students: 87					
A	B	C	D	E	FX
33,33	19,54	20,69	9,2	5,75	11,49
Lecturers: doc. Mgr. Tomáš Vinař, PhD.					
Last change: 24.10.2016					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-119/15	Mathematics - Generic Subject

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 3

A	B	C	D	E	FX
0,0	0,0	100,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KI/1-BIN-301/15	Methods in Bioinformatics

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:
Homework assignments, group project, written exam
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will be familiar with basic problems and methods in bioinformatics; they will be able to choose an appropriate method for a given biological problem and to interpret its results.

Class syllabus:
Basic concepts from molecular biology, algorithms and machine learning. Sequencing and assembling genomes. Gene finding. Sequence alignment. Evolutionary models and phylogenetic trees. Comparative genomics. RNA structure. Motif finding and gene expression analysis. Protein structure and function. Selected current topics.
Students of computer science programs will focus on computer science methods and mathematical modeling of the covered problems. Life science students will focus on understanding and correct application of these methods on real data.

Recommended literature:
Biological sequence analysis : Probabilistic models of proteins and nucleic acids / Richard Durbin ... [et al.]. Cambridge : Cambridge University Press, 1998
Understanding bioinformatics / Marketa Zvelebil, Jeremy O. Baum. New York : Garland Science, 2008

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 68

A	B	C	D	E	FX
29,41	20,59	25,0	19,12	2,94	2,94

Lecturers: doc. Mgr. Bronislava Brejová, PhD., doc. Mgr. Tomáš Vinař, PhD., Mgr. Vladimír Boža, PhD.
Last change: 08.02.2018
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-953/15	**Course title:** Methods of Applied Informatics
Number of credits: 4	
Educational level: II.	
State exam syllabus:	
Last change: 23.09.2017	
Approved by: prof. RNDr. Roman Ďurikovič, PhD.	

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-246/15	Multiagent Systems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
exercises and project participation
Scale: A 75%, B 68%, C 62%, D 56%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
We provide knowledge from domain of multi-agent system. The primary focus is put on development of system which produces extremely complex behavior (robots, models of living creatures).

Class syllabus:
Agent (a specific definition). Autonomy and mobility. Receptors, efectors, controller, senzors, aktuators. Agent classification: reactive, deliberative and hybrid agents. Communication among agents: direct and indirect. Representation languages: XML and KIF. Multi-agent system (a specific definition). Communication languages. KQML.
Implementation of multi-agent systems. Multi-agent system implemented as a middleware.Implementation within OOP virtual machine. Implementation over SRR model (IPC). Pyramidal Client – Server architecture. Agent – Space architecture. Robustness, decentralization, normalization.
Deliberative and non-deliberative robotics. New artificial intelligence. Dekomposition by function and activity. Subsumption architecture. PKA model.

Recommended literature:
Cambrian intelligence : The early history of the new / Rodney A. Brooks. Cambridge, Mass. : MIT Press, 1999
http://www.microstep-mis.com/~andy
Jozef Kelemen: Strojovia a agenty, Archa, Bratislava, 1993
Nils J. Nilson: Artificial Intelligence, A new synthesis, Morgan Kaufman Publishers Inc., San Francisco, Ca, 1997
R. Brooks: Cambrian Intelligence, MIT Press, Cambridge, Mass, 1999

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 11

A	B	C	D	E	FX
45,45	36,36	9,09	9,09	0,0	0,0

Lecturers: RNDr. Andrej Lúčny, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KMANM/2-AIN-114/14	**Course title:** Multidimensional analysis and numerical mathematics
Educational activities: **Type of activities:** course **Number of hours:** **per week:** 4 **per level/semester:** 56 **Form of the course:** on-site learning	
Number of credits: 6	
Recommended semester: 1.	
Educational level: II.	
Prerequisites:	
Antirequisites: FMFI.KAGDM+KMANM/2-MPG-243/15	
Course requirements: Regular assessment: tests, homework, projects Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students should know the methods and tools for numerical computations required in a computer graphics (physical modeling and animation, global illumination problem, specific modeling), after completing the course.	
Class syllabus: The computational model in numerical mathematics. Numerical stability and robustness, error analysis. Approximation theory. Numerical algebra. Solving large systems of linear equations. Finding roots of nonlinear equations. Numerical differentiation and integration. Optimization - formulation challenges the foundations of convex analysis, numerical methods used to find minima - Gradient methods. Finite Difference Method and Finite Element Method. Introduction to numerical solution of equations diferencálnych. Libraries of numerical methods and work with them.	
Recommended literature: Numerická matematika pre informatika : Riešené príklady v programe Mathematica / Roman Ďurikovič, Vladimír Ďurikovič. Trnava : Univerzita sv. Cyrila a Metoda, 2011 Numerické metódy / Jela Babušíková, Marián Slodička, Juraj Weisz. Bratislava : Univerzita Komenského, 2000	
Languages necessary to complete the course: slovak, english	
Notes:	

Past grade distribution
Total number of evaluated students: 80

A	B	C	D	E	FX
20,0	5,0	13,75	32,5	25,0	3,75

Lecturers: Mgr. Jela Babušíková, PhD.

Last change: 14.01.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-132/15	Neural Networks

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAI/1-AIN-480/00

Course requirements:
individual projects, written and oral exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
After completing the course will student understands the basic principles of connectionism (neural networks) know the basic models of neural networks and know their usefulness when solving various tasks (eg. Pattern recognition, classification, time series prediction, memorizing patterns and others). Lectures are combined with computer simulations exercises in Matlab.

Class syllabus:
Introduction to artificial neural networks (NS), NS logical neurons. The digital / analog Perceptron: the concept of learning with a teacher pattern recognition.
Linear NS: vector spaces, autoassociative memory. Multi-layer perceptron: the method of back propagation error, training and test set, generalization, selection of model validation. Hebbovské learning without a teacher, feature extraction, principal component analysis. Learning the competition, self-organizing map clustering, topographic display. Hybrid NS: radial-basis-function NS algorithm for training, properties. Recurrent NS: temporal structure in data, models and algorithms for training, echo state networks, recurrent self-organizing maps. Hopfield model: deterministic and stochastic dynamics, attractors in state space, autoassociative memory. Deep architecture NS.

Recommended literature:
Neural networks and learning machines / Simon Haykin. Upper Saddle River : Pearson education, 2009
Úvod do teórie neurónových sietí / Vladimír Kvasnička ... [et al.]. Bratislava : Iris, 1997
Neural networks (slajdy k prednáškam), Igor Farkaš, Knižničné a edičné centrum FMFI UK v Bratislave, 2011.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 51

A	B	C	D	E	FX
31,37	7,84	11,76	13,73	11,76	23,53

Lecturers: prof. Ing. Igor Farkaš, Dr.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-286/15	Ontologies and Knowledge Engineering

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites: FMFI.KAI/2-AIN-108/15 - Computational Logic

Antirequisites: FMFI.KAI/1-AIN-646/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Martin Homola, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-264/00	OpenCV

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 79

A	B	C	D	E	FX
53,16	6,33	12,66	3,8	0,0	24,05

Lecturers: RNDr. Stanislav Stanek, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-204/10	Pattern Recognition

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
tests, projects, oral exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Graduates will acquire basic methods of classification.

Class syllabus:
The role of classification, feature articles and Syntax Notation.
Selection and pretreatment symptoms.
Classifiers, basic concepts.
Bayesian decision theory, discriminatory and divisive functions hypersurface, the criterion of the minimum error.
Decision trees.
Discriminant analysis, linear classifier.
Mechanisms of support vectors (SVM).
Neural networks.
Uncontrolled classifiers.
Hidden Markov models.
Quality rating classification.
Syntactic recognition, inference grammar. Special types of grammar.

Recommended literature:
Pattern classification / Richard O. Duda, Peter E. Hart, David G. Stork. New York : Wiley Interscience, 2001
Classification pattern recognition and reduction of dimensionality / edited by P. R. Krishnaiah, L. N. Kanal. Amsterdam : North-Holland, 1982
Modern multivariate statistical techniques : Regression, classification, and manifold learning / Alan Julian Izenman. New York : Springer, 2008

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 137					
A	B	C	D	E	FX
8,76	17,52	27,74	21,9	12,41	11,68
Lecturers: doc. RNDr. Milan Ftáčnik, CSc., RNDr. Zuzana Berger Haladová, PhD.					
Last change: 22.09.2017					
Approved by: prof. RNDr. Roman Ďurikovič, PhD.					

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-263/00	Photorealism

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Rendering equation and radiosity equation, final elements, radiosity, Monte Carlo sampling, density estimation, photon mapping, global rendering of dynamic scenes, BRDF measurement and light source measurement, global rendering in real time, IBR, tone mapping, perception effects.

Recommended literature:
Wei D., Durikovic R., Vilbrandt C., et. al., "IT Text series: Computer Graphics", 2003
Michael Cohen, John Wallace, Radiosity and Realistic Image Synthesis, Academic Press, 1993.
Andrew Glassner, Principles of Digital Image Synthesis, 2 Bände, Morgan Kaufman, 1996.
Jensen, Realistic Image Synthesis Using Photon Mapping

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 28

A	B	C	D	E	FX
57,14	7,14	25,0	3,57	0,0	7,14

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-110/00	Physical Education and Sport (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Practicing of the students´ game skills in collective sports: basketball, volleyball, football, floorball and hockey. Mastering of the basic technique of a particular sport discipline in other sports. In paddling, basic training on still and slightly flowing water. Development of coordination skills, improvement of articular mobility and cardiovascular system.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1329

A	B	C	D	E	FX
99,1	0,6	0,0	0,0	0,0	0,3

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-120/00	Physical Education and Sport (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Practicing of offensive and defensive game combinations and playing with modified rules in collective sports such as basketball, volleyball, football, floorball, hockey. Command of elements of higher difficulty in locomotion skills (swimming - crawl stroke, breast stroke, butterfly stroke, trampoline jumping and aerobics – practicing of areobics compositions, bodybuilding – development of the main muscle groups, paddling on running water. Testing of the level of physical fitness and coordination skills.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1223

A	B	C	D	E	FX
99,84	0,08	0,0	0,0	0,0	0,08

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Branislav Nedbálek, PaedDr. Mikuláš Ortutay, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Júlia Raábová, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-210/00	Physical Education and Sport (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
To improve offensive and defensive game combinations in collective sports. Practicing of tactical and technical elements in individual sports. Compensatory exercises to correct wrong body posture. Stretching. Competition rules in sport disciplines.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 992

A	B	C	D	E	FX
99,4	0,4	0,0	0,0	0,0	0,2

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-220/00	Physical Education and Sport (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Sport training for Faculty Championships in a selected sport with modified rules. Selection of sport-talented students into teams of the Faculty Sport League, University League of Bratislava Faculties, and participation in sport events of the Faculty and University.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 868

A	B	C	D	E	FX
99,31	0,46	0,0	0,0	0,12	0,12

Lecturers: PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, doc. PhDr. Vojtech Potočný, CSc., Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, Mgr. Branislav Nedbálek

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-206/15	Physical-based Animations and Mathematical Modeling

Educational activities:
Type of activities: lecture / independent work
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Evaluation: assignments, homeworks, written exams, computer animation project or programming project from physically based animation of natural phenomena
Exam: final exam, project presentation, oral exam
Evaluation scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Students will learn the basic techniques of simulation particle systems, solving systems of ordinary differential equations numerically, the object collision detection. Understand the principles of dynamics of rigid bodies and the principle of the creation of computer animation and camera movement. Understand how to construct physics engine for games or video animation.

Class syllabus:
Particle systems, motion equations of first order integration methods to calculate the speed and position, state vector system, external forces, restrictive conditions - constraints, response forces, particle collisions - plane.
Numerical solution of differential equations, Euler method, Runge-Kuta method, stability criteria to select the time step.
Lagrange method without networks, modeling and animation point cloud, SPH, deformation
Animation mobility, spline interpolation to animate movement, reparametrisation spline curves by length, and orientation quaternion interpolation of two or more quaternion.
Collision detection, Z buffer algorithm, necessary and sufficient conditions when there are two bodies in a collision, parting line, hierarchy envelopes force response (Response Forces). Three phase detection wide, medium and narrow.
Dynamics of rigid bodies, equations of motion, velocity, acceleration, angular velocity and angular acceleration, inertia matrix.
Procedurárne animation, systems and methods for creating computer animation liquids, fire, smoke.
Computer animation in games and in the film industry. Other applications of computer animation with further developments in the field of computer animation using physical effects.

Recommended literature:

Visual Quantum mechanics : Selected Topics with Computer/Generated animations of Quantum-Mechanical phenomena / Bernd Thaller. New York : Springer, 2000
Computer facial animation / Frederic I. Parke, Keith Waters. Wellesley : A. K. Peters , 1996
SIGGRAPH tutorialy dostupné na http://dl.acm.org/dl.cfm?CFID=412417535&CFTOKEN=50913605
Dostupné texty k prednáške. https://dai.fmph.uniba.sk/w/Physical-based_Animations_and_Mathematical_Modeling_Material

Languages necessary to complete the course:
english

Notes:

Past grade distribution
Total number of evaluated students: 187

A	B	C	D	E	FX
45,45	18,18	10,7	8,02	6,95	10,7

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-290/15	Practice

Educational activities:
Type of activities: practice
Number of hours:
per week: **per level/semester:** 150s
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 84

A	B	C	D	E	FX
57,14	8,33	27,38	5,95	0,0	1,19

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-118/14	Programming in operating systems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
A homeworks, project
written exam
Scale: 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
After completing the course, students will be able to create a low-level system programs and services that communicate directly with the operating system or hardware. Get an overview of the interfaces between the operating system and the user and the access code and techniques for creating system programs.

Class syllabus:
System call, communication with the hardware, work with file systems, networks; run programs, dynamic link libraries, processes and threads, synchronization mechanisms; system services (services), security (authentication, authorization, protection against failures and attacks) vs userspace kernelspace, driver (driver module)

Recommended literature:
Modern operating systems / Andrew S. Tanenbaum. Upper Saddle River : Prentice Hall International, 2001

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 84

A	B	C	D	E	FX
21,43	21,43	21,43	17,86	3,57	14,29

Lecturers: RNDr. Jozef Šiška, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-109/15	Programming of Parallel and Distributed Systems

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 3 / 1 **per level/semester:** 42 / 14
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
excercises, exam
A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Graduates of the course will be familiar with the issues of parallel and distributed programming. At the beginning they learn the means of writing parallel and distributed programs as necessary logic to evidence and formulate their properties. Later they learn the solution of selected problems in parallel and distributed programming (eg. The shortest path problem Reader-Writers, Večerajúci philosophers, coordination meetings, drinkers philosophers, sorting, Faulty channels, Global snapshots, detected a stable qualities, Byzantine Agreement).

Class syllabus:
Initially, the students met a simple language for writing parallel programs and dostribuovaných. UNITY (syntax and semantics) Fundamental parallel and distributed architectures as a way for them to map UNITY programs. The list is the logic of allowing express safetty and progress vlastnostio programs and formally prove the correctness of programs. Subsequently they learn the solution of selected problems in parallel and distributed programming (eg. The shortest way, reader-writers problem dinning philosophers, coordination meetings, drinkers philosophers, sorting, Faulty channels, Global snapshots, detected a stable qualities, Byzantine Agreement). Their zones can optionally be spread in závoslosti the development in this area.

Recommended literature:
Parallel program design : A Foundation / K. Mani Chandy , Jayadev Misra. Reading : Addison-Wesley, 1988
An introduction to parallel algorithms / Joseph Jájá. Boston : Addison-Wesley, 1992
C. Stirling: Modal and Temporal Properties of Processes, Springer 2001
Elektronické poznámky k prednáške, http://ii.fmph.uniba.sk/~gruska/udpp/Beziacaudppprednaska2014.pdf

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 98

A	B	C	D	E	FX
14,29	14,29	24,49	29,59	10,2	7,14

Lecturers: doc. RNDr. Damas Gruska, PhD.

Last change: 13.01.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-923/15	Project Seminar (1)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
Evaluation of the diploma thesis progress
1. Presentation, 2. First prototype implemented, 3. Research papers studied and the detail knowledge of the the problem is required. 4. Framework for development of the thesis should be already set.
A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Learning to quickly extract the basic idea of scientific articles.

Class syllabus:
The first phase of the project master thesis. Conventions for writing professional texts informatics. Work on the project and implementation so that results in the diploma thesis.

Recommended literature:
LATEX : Podrobný průvodce / Helmut Kopka, Patrick W. Daly ; překlad Jan Gregor. Brno : Computer Press, 2004
LATEX : A Document preparation system / Leslie Lamport. Reading : Addison-Wesley, 1986

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 128

A	B	C	D	E	FX
56,25	14,84	14,06	3,13	2,34	9,38

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-924/15	Project Seminar (2)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites: FMFI.KAI/2-AIN-923/15 - Project Seminar (1)

Recommended prerequisites:
2-AIN-924 Projektový seminár (1)

Course requirements:
Evaluation of the diploma thesis progress
1. Presentation, 2. First prototype implemented, 3. Research papers studied and the detail knowledge of the the problem is required. 4. Framework for development of the thesis should be already set. 5. Ano chapter of the thesis should be in its final stage.
All requirements must be satisfactory completed.
A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Theoretical background of the thesis will be known and the implementation flips to its final stage of evaluation.

Class syllabus:

Recommended literature:
LATEX : Podrobný průvodce / Helmut Kopka, Patrick W. Daly ; překlad Jan Gregor. Brno : Computer Press, 2004
LATEX : A Document preparation system / Leslie Lamport. Reading : Addison-Wesley, 1986

Languages necessary to complete the course:
slovensky, anglicky

Notes:

Past grade distribution
Total number of evaluated students: 136

A	B	C	D	E	FX
55,15	13,24	10,29	4,41	8,09	8,82

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 23.09.2017
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-145/10	Qualitative Modelling and Simulation

Educational activities:
Type of activities: course
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 4.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KI/2-AIN-143/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 63

A	B	C	D	E	FX
36,51	19,05	15,87	11,11	17,46	0,0

Lecturers: doc. RNDr. Martin Takáč, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-128/15	**Course title:** Real-time Graphics and GPU Computations

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAGDM/2-MPG-101/00 and FMFI.KAGDM/2-MPG-102/00

Course requirements:
project, oral exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 70/30

Learning outcomes:
The course represents the key themes, principles and techniques used in the rendering of virtual scenes in real time. This procedure is most commonly used in making 3D games, but also in various scientific vizualizations, such as visualization of medical data. After the course the students will be able to analyze and implement current procedures, algorithms, programming effects for graphics cards and the create the visualization applications. The subjects students will be able to develop gaming applications on different platforms, applications in virtual and mixed reality and create visualizations of medical data.

Class syllabus:
1. Graphic display channel - description of the graphics hardware architectures, programming of graphics cards, coordinate systems, programmable parts of the display channel, description and formats of virtual scene during the rendering, OpenGL API
2. Animation - a description of the object pose representation (position, rotation, scale), nuts and Quaternions, linear and cubic interpolation for animation
3. Light - description of lighting models and their implementation using shaders, textures in lighting model, direct and defferred lighting, use rendering to texture and shadows, approximation of global illumination methods
4. Post-process Effects - description of algorithms to improve the quality of the final output image, motion blur, depth of field, SSAO, reflections and refractions, HDRI, bloom, toon shading
5. Image-based rendering - use of texture to speed up calculations of lighting, textures for backgrounds to represent complex objects (bilboarding), image processing algorithms on the GPU, volumetric graphics
6. Accelerating algorithms - algorithms and structures to accelerate rendering complex scenes, trimming techniques, level of detail, collision detection

7. GPGPU - description of the graphics card performance for general computing, CUDA and OpenCL language, image and video processing, physical simulation of phenomena on the GPU, ray tracing on the GPU

Recommended literature:
Real-time rendering / Tomas Akenine-Möller, Eric Haines, Naty Hoffman. Wellesley : A. K. Peters, 2008

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 8

A	B	C	D	E	FX
37,5	37,5	0,0	0,0	0,0	25,0

Lecturers: Mgr. Andrej Mihálik, PhD.

Last change: 14.01.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-161/00	Russian Language (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject provides a course in Russian language for beginners.

Recommended literature:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 642

A	B	C	D	E	FX
60,9	16,2	9,66	4,83	1,71	6,7

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-162/00	Russian Language (2)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The subject continues the program of Russian language (1) and provides a course of Russian for beginners.

Recommended literature:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 389

A	B	C	D	E	FX
65,81	16,2	9,0	3,34	1,03	4,63

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-261/00	Russian Language (3)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.

Recommended literature:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 191

A	B	C	D	E	FX
70,68	17,28	8,38	2,62	0,0	1,05

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/1-MXX-262/00	Russian Language (4)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level.

Recommended literature:
The textbook has not been published. It is at students' disposal in an electronic format.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 130

A	B	C	D	E	FX
73,85	13,85	7,69	3,08	0,77	0,77

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KZVI/2-AIN-115/15	**Course title:** Software for Education

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: Review software, written test, project specifications, functional prototype project
Approximate evaluation scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Students are able to assess the suitability of a particular educational software for teaching informatics at the elementary, secondary, respectively. University. He is able to classify educational software. It can give examples of software that is suitable for training for a specific age group of students. Zrecenzuje educational software. Able to apply the basics of Software Engineering of Educational Software. It creates a team with one of my colleagues and common specifications software project for teaching science. It implemented a working prototype project.

Class syllabus:
• The importance of digital technology in the cognitive process of teaching and learning.
• Place of Digital Technologies in the Cognitive Process.
• Information Literacy.
• Digital Technologies and Cognitive Process.
• The Contribution of Digital Technologies for teaching.
• Definition and classification of educational software, the criteria for its evaluation.
• Evaluation of Educational Software.
• Methaphors about EduSoft.
• Criteria for Evaluation Educational Software.
• Educational applications for teaching Computer Science for students in elementary and middle school.
• Graphical User Interface.
• Human-Computer Interaction.
• Software for learning and developmental stages of knowledge.
• Developing High-Quality Educational Software.
• Software Engineering and its use in the programming of educational software.
• Software Development Life Cycle (SDLC).

• Multimedia and their place in the cognitive process.
• Four Cognitive Stages for Child Development.
• J. Piaget. S. Papert. Constructivism. Constructionism.
• Design-Base Research and Action research – students as co-author of the software for education.
• Characteristics Design-Based Research (DBR).
• Comparison of DBR with Action Research.
• Key Characteristics of DBR
• Phases in DBR.
• Types of Action Research.
• Steps in Action Research.
• Principles of software for education.
• Design Principles – Cognitive Development, Physical Development, Social/Emotional Development
• Software for learning for pupils with special needs.
• Children with low vision.
• Dyslexia.
• Autism.
• Learning difficulties.

Recommended literature:
Educational software. Enschede : Educational computing consortium, [s.a.]
documents in Moodle

Languages necessary to complete the course:
slovak, english

Notes:

Past grade distribution
Total number of evaluated students: 66

A	B	C	D	E	FX
40,91	25,76	19,7	1,52	1,52	10,61

Lecturers: doc. PaedDr. Monika Tomcsányiová, PhD., Mgr. Karolína Mayerová, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-288/15	Speech Recognition

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 4.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAI/2-IKV-265/00

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 6

A	B	C	D	E	FX
83,33	0,0	0,0	16,67	0,0	0,0

Lecturers: RNDr. Marek Nagy, PhD.

Last change: 18.02.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-115/15	Sports in Nature (1)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 171

A	B	C	D	E	FX
99,42	0,0	0,58	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-115/15	Sports in Nature (1)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 2.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 171

A	B	C	D	E	FX
99,42	0,0	0,58	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-215/15	Sports in Nature (2)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 3.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 94

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/1-MXX-215/15	Sports in Nature (2)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester: 4.

Educational level: I., II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 94

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Mgr. Martin Dovičák, Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický

Last change: 25.05.2016

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAI/2-AIN-285/17	**Course title:** Symbolic Programming and LISP
Educational activities: **Type of activities:** course **Number of hours:** **per week:** 3 **per level/semester:** 42 **Form of the course:** on-site learning	
Number of credits: 4	
Recommended semester: 4.	
Educational level: II.	
Prerequisites:	
Course requirements: Preliminary assessment: homeworks, test, projects. Scale: A 90%, B 80%, C 70%, D 60%, E 50%. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: To acquaint students not only with the programming language LISP, but also with programming paradigms like data and procedure abstraction, functional programming, symbolic programming, and object-oriented programming. Graduates gain knowledge how to design and construct interpreters/compilers of LISP-like programming languages.	
Class syllabus: 1. Procedure Abstraction: basic expressions, compound procedures, high level procedures. 2. Data Abstraction: basic data types, symbolic data, structured data, procedural data. 3. Modularity, Objects and Local State: environment model, representing local state, stream as lists with delayed evaluation. 4. LISP Interpreter: metainterpreter, strict and lazy evalutation, nondeterministic evaluation. 5. LISP Compiler: register machines, register machine simulator, storage allocation, compilation.	
Recommended literature: Hal Abelson and Jerry Sussman and Julie Sussman. Structure and Interpretation of Computer Programs. MIT Press, second edition, 1996.	
Languages necessary to complete the course: slovak, english	
Notes:	

Past grade distribution
Total number of evaluated students: 1

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: Ing. Ján Komara, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KAGDM/2-AIN-223/15	Virtual and Extended Reality

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
tests, project, written and oral exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
After graduating, students will understand the theoretical foundations and practical skills in creating the team applications in enhanced and virtual reality.

Class syllabus:
Virtual reality, definitions and basic concepts. Description language VR. Authoring tools. Virtual interaction by Qvortrup. Virtual galleries, museums and cities. Selected Techniques of virtual population (avatars, autonomous agents). Augmented Reality, definition of terms, history, major milestones, motivation, augmented reality applications. System for augmented reality: inputs, outputs, hardware, Fish Tank- basic tools. Registration in Augmented Reality (Marker, Markerless, rgbda, GPS) Mobile Augmented Reality (Vuforia, Layar, Metaio ...) Spatial Augmented Reality-aided design (hardware calibration, the combination of projectors)

Recommended literature:
Real-time rendering / Tomas Akenine-Möller, Eric Haines, Naty Hoffman. Wellesley : A. K. Peters, 2008
Vlastné elektronické texty vyučujúceho predmetu zverejňované prostredníctvom web stránky predmetu.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 24

A	B	C	D	E	FX
45,83	33,33	12,5	0,0	0,0	8,33

Lecturers: doc. RNDr. Andrej Ferko, PhD., RNDr. Zuzana Berger Haladová, PhD.
Last change: 23.09.2017
Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-255/15	Visual Information Processing

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 28
Form of the course: on-site learning

Number of credits: 3

Recommended semester: 4.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1

A	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0

Lecturers: RNDr. Zuzana Černeková, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI/2-AIN-120/15	Visual Information Processing - Generic Subject

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

A	B	C	D	E	FX
0,0	50,0	50,0	0,0	0,0	0,0

Lecturers: prof. RNDr. Roman Ďurikovič, PhD.

Last change: 02.06.2015

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KZVI/2-AIN-224/15	Web Programming

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
homeworks, project
practical exam
Scale: A 92%, B 84%, C 76%, D 68%, E 60%
Scale of assessment (preliminary/final): 75/25

Learning outcomes:
The student will be able to create extensive educative web application using databases, respectively. storage and other advanced technologies for the development of dynamic web applications.

Class syllabus:
HTML5 - Canvas, Web Storage, Media, Drag Drop
JQuery, jQuery UI
AJAX - manipulation of objects in their properties (and CSS), effects, event handling, effective work with forms, etc.

Recommended literature:
Jazyky XHTML CSS DHTML WML : Kompletní referenční příručka pro tvorbu webu a WAPu / Petr Pexa. České Budějovice : KOPP, 2006
w3schools.com
jquery.com

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 101

A	B	C	D	E	FX
54,46	10,89	15,84	2,97	9,9	5,94

Lecturers: PaedDr. Roman Hrušecký, PhD.

Last change: 23.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAI+KZVI/2-AIN-111/15	Web Technologies and Methodology

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 2 **per level/semester:** 28 / 28
Form of the course: on-site learning

Number of credits: 6

Recommended semester: 1.

Educational level: I., II.

Prerequisites:

Course requirements:
homeworks, project, written project
exam
Scale: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Overview of web technologies in connection with their use and applications for different purposes.
The principles of designing websites, applications, web-based user interfaces, and web content.

Class syllabus:
- Architecture WWW
- Web technology on the server side (overview)
- Web technology on the client side (overview)
- Types of websites, applications, components and interfaces
- The methodology of web sites and applications
- Information Architecture
- Structure of the Web Sites
- Design of the Web Sites
- Principles and methodology of web content
- Testing, optimization and management of web applications and web content
- Level of quality of web sites and applications

Recommended literature:
Information architechture for the World Wide Web / Louis Rosenfeld, Peter Morville. Cambridge : O´Reilly, 1998
Tvoříme přístupné webové stránky : Připraveno s ohledem na novelu Zákona č. 365/2000 Sb., o informačních systémech veřejné správy / David Špinar. Brno : Zoner Press, 2004
Web Style Guide, 3rd ed. / P.J. Lynch, S. Horton. Yale University Press, 2008. Dostupné online: http://webstyleguide.com/wsg3/

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 89

A	B	C	D	E	FX
7,87	12,36	7,87	12,36	41,57	17,98

Lecturers: doc. RNDr. Zuzana Kubincová, PhD., RNDr. Martin Homola, PhD., Mgr. Ján Kľuka, PhD., RNDr. Kristína Malinovská, PhD.

Last change: 22.09.2017

Approved by: prof. RNDr. Roman Ďurikovič, PhD.