Course descriptions

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COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ+KMANM/2-MMN-111/15	Algorithms on 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: 5

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: 170

A	B	C	D	E	FX
15,29	27,65	18,82	20,59	16,47	1,18

Lecturers: Mgr. Katarína Boďová, PhD.

Last change: 18.12.2018

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-109/15	Computer Statistics

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: 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: 217

A	B	C	D	E	FX
72,81	16,59	6,91	1,38	1,84	0,46

Lecturers: Mgr. Ján Somorčík, PhD.

Last change: 12.10.2016

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-117/12	Convex Optimization

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: 2.

Educational level: II.

Prerequisites:

Recommended prerequisites:
Nonlinear programming, Linear programming

Course requirements:
Homeworks, Project presentation
Grading A 91%, B 81%, C 71%, D 61%, E 51%
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Student learn the basic theory of convex analysis and convex (conic) optimization,
basic classes of convex conic programming, and methods for solving them, they are able to use Matlab and CVX modeling system for solving convex problems, they are able to solve various practical problems and applications.

Class syllabus:
Convex optimization problems in standard form
Generalization of standard convex problems
Conic convex problems (SDP, SOCP,..)
Geometry of convex cones
Duality theory for conic linear programs
Applications of convex conic problems
Conic relaxations
Interior point methods

Recommended literature:
1. Boyd, Vandenberghe: Convex Optimization, Cambridge Univ.Press 2004
2. CVX: Matlab Software for Disciplined Convex Programming www.stanford.edu/~boyd/cvxbook
3. Ben-Tal, Nemirovski: Lectures on Modern Convex Optimization, SIAM 2001

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 88

A	B	C	D	E	FX
75,0	11,36	6,82	2,27	2,27	2,27

Lecturers: doc. RNDr. Mária Trnovská, PhD.

Last change: 16.05.2018

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-219/19	DEA Seminar

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: 2

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: 4

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

Lecturers: doc. RNDr. Margaréta Halická, CSc.

Last change: 03.09.2019

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-113/18	Databases and Data Analysis

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: 3

Recommended semester: 2.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAMŠ/2-EFM-113/17

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 113

A	B	C	D	E	FX
86,73	4,42	6,19	0,88	0,88	0,88

Lecturers: Mgr. Stanislav Sekereš

Last change: 12.12.2018

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-237/15	Digital Signal 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: 63

A	B	C	D	E	FX
77,78	14,29	4,76	1,59	0,0	1,59

Lecturers: Mgr. Soňa Kilianová, PhD.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-920/00	Diploma Thesis Seminar

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): 100/0

Learning outcomes:

Class syllabus:
In a drawn order the students present a 15 minute talk on their thesis in the corresponding state of completion and respond to questions and comments of their classmates. To obtain the credits, in addition to the presentation the student has to take part in the discussion at least three times during the semester and submit several pages of his/her thesis electronically or in a printed form at its end.

Recommended literature:
By choice of the thesis supervisor

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 500

A	B	C	D	E	FX
77,2	16,2	4,8	0,8	0,2	0,8

Lecturers: prof. RNDr. Daniel Ševčovič, DrSc., doc. Mgr. Igor Melicherčík, PhD.

Last change: 02.06.2015

Approved by:

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAMŠ/2-EFM-991/15	**Course title:** Diploma Thesis and its Defense
Number of credits: 25	
Educational level: II.	
State exam syllabus:	
Last change:	
Approved by:	

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-119/15	Dynamic Macroeconomics

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: 2

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: 105

A	B	C	D	E	FX
60,95	21,9	9,52	1,9	3,81	1,9

Lecturers: doc. RNDr. Ján Boďa, CSc.

Last change:

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-115/15	Economics Seminar

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: 2

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: 9

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

Lecturers: doc. RNDr. Ján Boďa, CSc.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-125/00	Economics of Information

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: 2

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 50/50

Learning outcomes:

Class syllabus:
Classes of models with asymmetric information. Subjective risk with hidden action or hidden information. Adverse selection. Mechanism design and post-contractual hidden knowledge. Signalling and detection.

Recommended literature:
E. Rasmusen: Games and Information, An Introduction to Game Theory, 4th Edition. Blackwell Publishers, 2006
Mas-Collel, Whinston, Green: Microeconomic Analysis. Oxford University Press, 1995
Fudenberg , Tirole: Game Theory. MIT Press,1998

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 236

A	B	C	D	E	FX
99,15	0,0	0,0	0,0	0,0	0,85

Lecturers: doc. RNDr. Ján Pekár, PhD.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-228/00	Econophysics

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: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 40/60

Learning outcomes:

Class syllabus:
Utilization opportunities of the principles and methods of statistical physics in economy and finance. Fractal and power-law probability distributions. Scaling and universality in physics. Power-law probability distributions in economy and finance. Minority games. Statistical mechanics of money.

Recommended literature:
An introduction to Econophysics : Correlations and Complexity in Finance / Rosario N. Mantegna, H. Eugene Stanley. Cambridge : Cambridge University Press, 2000

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 170

A	B	C	D	E	FX
75,88	10,0	14,12	0,0	0,0	0,0

Lecturers: doc. RNDr. Ján Boďa, CSc.

Last change: 18.06.2015

Approved by:

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: 193

A	B	C	D	E	FX
65,28	13,99	7,25	2,07	1,55	9,84

Lecturers: PhDr. Elena Klátiková, Mgr. Aneta Barnes

Last change: 02.06.2015

Approved by:

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: 118

A	B	C	D	E	FX
73,73	15,25	4,24	0,85	0,0	5,93

Lecturers: PhDr. Elena Klátiková, Mgr. Aneta Barnes

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-153/17	Finance and Insurance in Practice (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: 2

Recommended semester: 1., 3.

Educational level: II.

Prerequisites:

Course requirements:
Preliminary assessment: active participation in seminars, solving tasks during workshops, individual work
Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, the student will master the basics of work in the financial and insurance business. Student should also learn about the roles of the actuary, risk manager and financial analyst.

Class syllabus:
Basic financial and insurance segments. Banks and insurance companies - joint-stock companies and their legislative background.
The role of financial analysts, risk managers and actuaries in banks, insurance companies and in other financial institutions. International professional qualification of actuaries, stages in actuarial qualification, the career of an actuary. Profession of Actuary in Slovakia and globally.
Professional software used in financial and insurance practice.

Recommended literature:
Poisťovníctvo / Anna Majtánová a kolektív. Bratislava : Wolters Kluwer (Iura Edition), 2009

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 70

A	B	C	D	E	FX
78,57	15,71	1,43	1,43	1,43	1,43

Lecturers: Mgr. Gábor Szűcs, PhD.

Last change: 12.09.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-154/17	Finance and Insurance in Practice (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: 2

Recommended semester: 2., 4.

Educational level: II.

Prerequisites:

Course requirements:
Preliminary assessment: active participation in seminars, solving tasks during workshops, individual work
Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, the student will master the basics of work in the financial and insurance business. Student should also learn about the roles of the actuary, risk manager and financial analyst.

Class syllabus:
Basic financial and insurance segments. Actuarial model development in life and non-life insurance. Financial modelling.
The role of financial analysts, risk managers and actuaries in banks, insurance companies and in other financial institutions. Professional requirements for financial analysts, risk managers and actuaries.
Professional software used in financial and insurance practice.

Recommended literature:
Poisťovníctvo / Anna Majtánová a kolektív. Bratislava : Wolters Kluwer (Iura Edition), 2009

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
75,93	11,11	9,26	1,85	0,0	1,85

Lecturers: Mgr. Gábor Szűcs, PhD.

Last change: 12.09.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-106/15	Financial Derivatives

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: 5

Recommended semester: 2.

Educational level: II.

Prerequisites: FMFI.KAMŠ/2-EFM-107/15 - Partial Differential Equations

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 149

A	B	C	D	E	FX
36,24	23,49	22,15	9,4	8,05	0,67

Lecturers: doc. RNDr. Mgr. Beáta Stehlíková, PhD.

Last change: 02.06.2015

Approved by:

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: 421

A	B	C	D	E	FX
45,13	20,43	19,48	9,03	1,9	4,04

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by:

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: 259

A	B	C	D	E	FX
38,22	25,87	20,08	10,42	2,7	2,7

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by:

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: 101

A	B	C	D	E	FX
37,62	28,71	21,78	6,93	0,99	3,96

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by:

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: 71

A	B	C	D	E	FX
39,44	33,8	18,31	2,82	1,41	4,23

Lecturers: Mgr. Ľubomíra Kožehubová

Last change: 02.06.2015

Approved by:

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: 717

A	B	C	D	E	FX
35,43	27,62	19,8	9,21	2,79	5,16

Lecturers: Mgr. Alexandra Maďarová, Mgr. Marián Mancovič

Last change: 02.06.2015

Approved by:

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: 468

A	B	C	D	E	FX
35,47	20,51	20,73	13,46	3,42	6,41

Lecturers: Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by:

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: 158

A	B	C	D	E	FX
39,24	26,58	21,52	6,96	2,53	3,16

Lecturers: Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by:

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: 85

A	B	C	D	E	FX
40,0	25,88	12,94	11,76	3,53	5,88

Lecturers: Mgr. Alexandra Maďarová

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-126/00	Industrial Organization

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: 2

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 40/60

Learning outcomes:

Class syllabus:
Marker structure and competition: perfect competition; monopoly; oligopoly; costs.
Obstacles in entering the market, fusions. Vertical obstacles and vertical connecting.
Firms' entering to market, leaving market, obstacles by entering.
Strategies of price determination and product differentiation.
Fusions, cartels, agreements.
Research and development: investments to research and development, licences.
Advertisement. Marketing strategies. Quality and endurance of products.

Recommended literature:
Shy, Oz Industrial Organization, MIT Press 1998

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 209

A	B	C	D	E	FX
97,13	2,39	0,0	0,0	0,0	0,48

Lecturers: doc. RNDr. Ján Pekár, PhD.

Last change: 18.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-201/15	Insurance Theory

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: 5

Recommended semester: 3.

Educational level: II.

Prerequisites: FMFI.KAMŠ/2-EFM-104/17 - Stochastic Calculus and Its Applications and leboFMFI.KAMŠ/2-EFM-104/15 - Financial Mathematics

Course requirements:
Examination: Written and oral examination.
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%.
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
After completing the course, the student will master basic methods of life and non-life insurance. He or she will be able to solve typical insurance problems, e.g. premium calculation, reserving and actuarial estimation.

Class syllabus:
General principles of insurance and their properties. Property and liability insurance. Collective risk model. Estimation of the number and size of claims. Deductible, excess and franchise. Reinsurance; proportional and non-proportional forms of reinsurance; quota share reinsurance, surplus reinsurance, excess-of-loss reinsurance, stop-loss reinsurance. Bonus-malus schemes and No-Claim Discount (NCD) systems. Credibility theory. American and Bayesian approach - various models. Estimation of technical provisions in non-life insurance, run-off triangles: chain-ladder method, separation method and other methods.
General principles of life insurance. Deterministic approach. Equation of value. Pure endowment, assurances (whole life, term, deferred, increasing), endowment, annuities (whole life, term, deferred, increasing). Stochastic approach, force of mortality, future lifetime and expected future lifetime, mortality models. Net and gross premiums. Policy values, prospective and retrospective net reserves, gross reserve, Zillmer reserve. Surrender and paid-up values. Alterations to policies. Variations of interest rates, mortality and costs assumptions.

Recommended literature:
Potocký, R.: Modely v životnom a neživotnom poistení, Statis, 2012.
Sekerová, V., Bilíková, M.: Poistná matematika, EU Bratislava 2000.
Gerber, H. U.: Life Insurance Mathematics, Springer-Verlag, 3rd Edition, 1997.
Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M.: Modern Actuarial Risk Theory Using R. Second Edition, Springer-Verlag Berlin Heidelberg, 2008.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 63

A	B	C	D	E	FX
47,62	17,46	20,63	4,76	9,52	0,0

Lecturers: doc. RNDr. Rastislav Potocký, PhD., Mgr. Gábor Szűcs, PhD.

Last change: 24.07.2020

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-217/11	Insurance Theory Classes

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:

Recommended prerequisites:
2-EFM-201 Insurance Mathematics

Course requirements:
Preliminary semester evaluation: exam.
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course, the student will master basic methods of life and non-life insurance. He or she will be able to solve typical insurance problems, e.g. premium calculation, reserving and actuarial estimation.

Class syllabus:
General principles of insurance and their properties. Property and liability insurance. Collective risk model. Estimation of the number and size of claims. Deductible, excess and franchise. Reinsurance; proportional and non-proportional forms of reinsurance; quota share reinsurance, surplus reinsurance, excess-of-loss reinsurance, stop-loss reinsurance. Bonus-malus schemes and No-Claim Discount (NCD) systems. Credibility theory. American and Bayesian approach - various models. Estimation of technical provisions in non-life insurance, run-off triangles: chain-ladder method, separation method and other methods.
General principles of life insurance. Deterministic approach. Equation of value. Pure endowment, assurances (whole life, term, deferred, increasing), endowment, annuities (whole life, term, deferred, increasing). Stochastic approach, force of mortality, future lifetime and expected future lifetime, mortality models. Net and gross premiums. Policy values, prospective and retrospective net reserves, gross reserve, Zillmer reserve. Surrender and paid-up values. Alterations to policies. Variations of interest rates, mortality and costs assumptions.

Recommended literature:
Potocký, R.: Modely v životnom a neživotnom poistení, Statis, 2012.
Sekerová, Bilíková: Poistná matematika, EU Bratislava 2000.
Gerber: Life Insurance Mathematics, Springer-Verlag, 3rd Edition, 1997.

Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M.: Modern Actuarial Risk Theory Using R. Second Edition, Springer-Verlag Berlin Heidelberg, 2008.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 137

A	B	C	D	E	FX
48,18	20,44	10,22	7,3	6,57	7,3

Lecturers: RNDr. Andrej Náther, PhD., Mgr. Gábor Szűcs, PhD., Mgr. Michaela Koščová, PhD.

Last change: 24.07.2020

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-MAT-114/15	Integral Transforms and Special Functions

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: 33

A	B	C	D	E	FX
42,42	27,27	6,06	3,03	6,06	15,15

Lecturers: prof. RNDr. Marek Fila, DrSc.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-139/10	Interior-point methods in linear programming

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: 2

Recommended semester: 3.

Educational level: II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
The fundamentals and history of interior-point methods in mathematic programming. Basic theories of interior-point methods in linear programming. Central path and its properties. Overview of interior-point algorithms. Estimation of the polynomial complexity of the primal-dual algorithms of following the central path. Implementation of algorithms.

Recommended literature:
R. J. Vanderbei: Linear Programming: Foundations and Exensions, Kluwer, Boston 1977, available on http://www.princeton.edu/irvdb/LPbook
M. Kabát: Metódy vnútorného bodu v lineárnom programovaní a ich aplikácie vo financiách, Diploma thesis (supervisor: M.Halická), FMFI UK, Bratislava, 2013

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 6

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

Lecturers: doc. RNDr. Margaréta Halická, CSc.

Last change: 17.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-218/16	Macroeconomic Development and Economic Policies in Slovakia

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:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 97

A	B	C	D	E	FX
50,52	32,99	16,49	0,0	0,0	0,0

Lecturers: Mgr. Ján Tóth

Last change:

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-118/10	Markov Processes (1)

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: 5

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Preliminary semester evaluation: test and homeworks
Examination: written examination
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%

Learning outcomes:
After completing the course the student will master elementary discrete time Markov chains models. He will be able to classify states of a Markov chain and calculate stationary probability distributions.

Class syllabus:
Markov property, transition probabilities, transition matrix, Chapman Kolmogorov equation, irreducibility of a chain. Classification of states, recurrent states, transient states, null recurrent states and positive recurrent states, periodicity. Existence of stationary distribution, ergodic distribution, necessary and sufficient conditions for ergodicity. Random walks, branching processes, absorbtion probabilities, mean time to absorbtion. Markov reward chains algorithms and Markov Chain Monte Carlo.

Recommended literature:
Kalas, J: Markovove reťazce, skriptá MFF UK
Norris, J.R.: Markov chains (1998)
Ross, S.M.: Introduction to probability models (2006)

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 240

A	B	C	D	E	FX
21,67	22,08	26,67	20,83	7,5	1,25

Lecturers: doc. RNDr. Katarína Janková, CSc., doc. Mgr. Pavol Bokes, PhD., Candan Çelik

Last change: 02.05.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-127/00	Mathematical Models in Demography

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: 2

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 40/60

Learning outcomes:

Class syllabus:
Aggregate models of population growth. Mortality tables as a model of stationary population. Models with age structure, time changes in mortality. Kaplan-Meier model, fertility models, Leslie model, Lotka renewal process. Stable equivalent population. Microeconomics models in demography.

Recommended literature:
Keyfitz, N.: Introduction to the Mathematics of Population with Revisions. Addison - Wesley, Reading, Mass. 1977.
Cipra, T.: Matematické modely demografie a pojištení. Praha, SNTL 1990
Preston, S.H., Heuveline, P., Guillot, M.: Demography. Measuring and Modeling Population Processes. Blackwell, Oxford 2001

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 260

A	B	C	D	E	FX
31,54	26,15	20,38	11,15	8,08	2,69

Lecturers: doc. RNDr. Karol Pastor, CSc.

Last change: 18.06.2015

Approved by:

STATE EXAM DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAMŠ/2-EFM-952/15	**Course title:** Mathematical and Financial Modelling
Number of credits: 4	
Educational level: II.	
State exam syllabus:	
Last change: 06.03.2020	
Approved by:	

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAMŠ/2-EFM-236/15	**Course title:** Modelling Biological Processes
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: Continuous assessment: homework, exam during the semester Exam: written and oral Approximate grading scale: A 90%, B 80%, C 70%, D 60%, E 50%	
Learning outcomes: Passing this subject, students will gain a basic understanding and overview of methods in biological modeling.	
Class syllabus: Biological modeling with ordinary differential equations: the principle of mass balance, mass action rule, scaling and nondimensionalisation, one-component models (Michaelis-Menten kinetics, gene autoregulation), multi-component models (biological switches, oscillators, epidemiology). Modeling with differential equations with delay. Models with spatial component: the reaction-diffusion systems, the spread of epidemics, pattern formation. Stochastic models: probability balance equation, Gillespie simulation algorithm, stochastic models of gene expression.	
Recommended literature: Mathematical biology : 1. : An introduction / J. D. Murray. New York : Springer, 2002 Mathematical biology : 2. : Spatial models and biomedical applications / J. D. Murray. New York : Springer, 2003 Keener, J., Sneyd, J., Mathematical physiology: I. Cellular physiology, 2nd. ed., Springer, New York, 2008 Wilkinson, D., Stochastic modelling for systems biology, 2nd ed., Chapman & Hall/CRC, Boca Raton, 2012.	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution
Total number of evaluated students: 69

A	B	C	D	E	FX
37,68	18,84	20,29	14,49	5,8	2,9

Lecturers: doc. Mgr. Pavol Bokes, PhD.

Last change: 19.10.2016

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-151/15	Multivariate Statistical Analyses

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: 5

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Preliminary assessment: project
Final examination: oral examination
Approximate final assessment: 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 master multivariate regression analysis, analysis of variance and covariance; further, they will be able to formulate and use multivariate statistical analyses in practical situations.

Class syllabus:
- Random vectors. (Random vectors, multivariate distributions, their densities, moments, and characteristic functions, transformations.)
- Multivariate normal distribution. (Properties of the multivariate normal distribution, marginal and conditional distributions.)
- Distribution of quadratic forms. (Wishart distribution, Hotelling distribution.)
- Estimating the parameters of multivariate linear models. (Likelihood function, maximum likelihood estimation, Cramer-Rao inequality.)
- Testing the hypotheses in multivariate linear models. (Likelihood ratio test, tests on parameters of the normal distribution, linear hypotheses.)
- Multivariate linear regression. (Linear regression model, least squares method.)
- Multivariate analysis of variance. (Analysis of variance model, one- and two-factor models, repeated measures model, profile analysis, growth curve models, multivariate analysis of variance.)
- Analysis of covariance.

Recommended literature:
Applied multivariate statistical analysis / Wolfgang Karl Härdle, Léopold Simar. Heidelberg : Springer, 2012
Multivariate statistics: : Exercises and solutions / Wolfgang Härdle, Zdeněk Hlávka. New York : Springer, 2007

Languages necessary to complete the course:

Slovak, English

Notes:
Additional information: http://www.iam.fmph.uniba.sk/ospm/Filova/teaching.htm

Past grade distribution
Total number of evaluated students: 189

A	B	C	D	E	FX
42,86	17,46	19,05	10,58	7,94	2,12

Lecturers: Mgr. Lenka Filová, PhD.

Last change: 11.04.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-116/10	Multivariate Statistical Analyses (2)

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: 5

Recommended semester: 2.

Educational level: II.

Prerequisites:

Recommended prerequisites:
2-PMS-115 Multivariate Statistical Analyses (1)

Antirequisites: PriF-FMFI.KAMŠ/N-bBXX-082/15 and FMFI.KAMŠ/2-PMS-116/19

Course requirements:
Preliminary semester evaluation: project
Final examination: oral examination
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Upon satisfactory completion of the course, students will be able to use selected multivariate statistical methods of dimensionality reduction, data clustering, discrimination and classification.

Class syllabus:
1) Principal components: theoretical properties of principal components, ratio of explained variance, selection of the number of principal components, sample principal components; 2) Metric multidimensional scaling; 3) Factor analysis: model of factor analysis, estimation of factor loadings, factor rotations, estimation of factor scores; 4) Canonical correlations: theoretical properties of canonical correlations, sample canonical correlations, coefficient of multiple correlation; 5) Cluster analysis: partitioning methods (k-means, k-medoids, normal model based clustering), hierarchical methods (agglomerative, divisive); 6) Linear discriminant analysis: derivation of linear discriminant rule from the Bayes classifier, estimation of the probability of misclassification; 7) Classification trees: recursive partitioning, optimal pruning; 8) Support vector machines: linearly separable and linearly non-separable case, nonlinear classification using support vector machines; 9) Artificial neural networks: introduction to the history and applications of neural networks, multilayer feed-forward neural network for classification.

Recommended literature:
1) Izenman, A: Modern Multivariate Statistical Techniques, Springer 2008; 2) Everitt BS, Hothorn T: A Handbook of Statistical Analyses Using R, Chapman and Hall/CRC 2006; 3) Everitt BS: An R and S-plus Companion to Multivariate Analysis, Springer 2005; 4) Lamoš F,

Potocký R: Pravdepodobnosť a matematická štatistika (štatistické analýzy), UK 1998; 5) Online materials of the lecturer.

Languages necessary to complete the course:
Slovak, English

Notes:
Further information can be found at http://www.iam.fmph.uniba.sk/ospm/Harman/teaching.htm

Past grade distribution
Total number of evaluated students: 448

A	B	C	D	E	FX
49,55	24,55	12,28	6,47	5,36	1,79

Lecturers: doc. Mgr. Radoslav Harman, PhD.

Last change: 11.04.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-212/15	Nonparametric Statistics

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: 150

A	B	C	D	E	FX
70,0	10,67	6,67	5,33	4,67	2,67

Lecturers: Mgr. Ján Somorčík, PhD.

Last change: 12.10.2016

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/2-EFM-101/15	Numerical Modelling

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 28 / 14
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 2.

Educational level: II.

Prerequisites:

Course requirements:
Continuous assessment: individual work, project
Exam: Written and oral test
Grading scheme: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
Student will be able to solve ordinary and partial differential equations by modern numerical methods.

Class syllabus:
Numerical methods for ordinary differential equations.
Initial value problem, one-step and multistep methods of Runge-Kutta type.
Methods for Solving Ordinary Differential Equations.
Applications of ODR numerical methods in physics and biology.
Numerical solution of boundary value problems for ordinary differential equations, difference method, shooting method.
Partial differential equation: Finite difference method for parabolic, hyperbolic and elliptic problems in 2D, explicit and implicit methods, stability, alternating direction method.
Applications of PDR numerical methods in physics and biology.
Implementation of numerical algorithms in Matlab and Python.

Recommended literature:
Numerická matematika II : Numerické řešení diferenciálních rovnic / Emil Vitásek. Praha : Univerzita Karlova, 1981
Numerické metody / Emil Vitásek. Praha : Státní nakladatelství technické literatury, 1987
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: 169					
A	B	C	D	E	FX
28,99	17,75	17,16	21,3	13,61	1,18
Lecturers: Mgr. Jela Babušíková, PhD., Mgr. Katarína Boďová, PhD.					
Last change: 16.12.2015					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAMŠ/2-EFM-118/15	**Course title:** Optimal Control (1)
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: 5	
Recommended semester: 1.	
Educational level: II.	
Prerequisites:	
Course requirements: Assessmentratio (preliminary/final): 30/70 Preliminary assessment: tests during the semester, project Final assessment: exam Scale of assessment (preliminary/final): 30/70	
Learning outcomes: The course provides an overview of the optimal control theory for solving optimization problems and reviews its main applications. The course introduces the basic methods of solving discrete problems that lead to the problems of dynamic programming. Moreover, methods allowing quantitative analysis for discrete problems are discussed.	
Class syllabus: Brief outline: Formulation of deterministic discrete problems of optimal control. Equation of dynamic programming for problems with finite and infinite time horizon. Methods of its solutions. Stochastic problems. Control and feedback control. Solving problems. Necessary conditions of optimality of variation type for discrete problems. Principle of maximum, economic interpretation of the adjoint variable, discrete Euler equation. Quality analysis.	
Recommended literature: Literature: M. Halická, P. Brunovský, P. Jurča: Optimálne riadenie. Viacetapové rozhodovacie procesy v ekonómii a financiách, EPOS, Bratislava 2009 (English translation)	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution
Total number of evaluated students: 193

A	B	C	D	E	FX
26,42	22,28	23,83	12,95	10,88	3,63

Lecturers: doc. RNDr. Margaréta Halická, CSc., RNDr. Zuzana Chladná, Dr.

Last change: 17.09.2020

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-109/00	Optimal Control (2)

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: 2.

Educational level: II.

Prerequisites: FMFI.KAMŠ/2-EFM-118/15 - Optimal Control (1)

Course requirements:
Scale of assessment (preliminary/final): 40/60

Learning outcomes:

Class syllabus:
Problems for calculus of variations and Euler's equation. Formulating the continuous optimal control problems. Pontryagin's maximum principle for different types of problems. Methods of analytic and numeric solutions (boundary-value problem), analysis of phase portraits. Solving problems. Problem of optimal consumption and Ramsey's model. Equation of dynamic programming, economic interpretation of the adjoint variable. Existence of optimal control. Sufficient conditions of optimality. Singular control. Problems with infinite time horizon.

Recommended literature:
M. Halická, P. Jurča: Optimálne riadenie 2 (učebný text http://pc2.iam.fmph.uniba.sk/institute/halicka/)
M.I. Kamien, N.L. Schwartz: Dynamic Optimization. The Calculus of Variations and Optimal Control in Economics and Management, ELSEVIER 1995

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 539

A	B	C	D	E	FX
26,53	17,25	14,84	14,1	25,05	2,23

Lecturers: doc. RNDr. Margaréta Halická, CSc.

Last change: 17.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-147/15	Optimal Control Classes

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:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 160

A	B	C	D	E	FX
55,0	24,38	12,5	3,75	1,88	2,5

Lecturers: Mgr. Soňa Kilianová, PhD., Mgr. Jana Szolgayová, PhD.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-107/15	Partial Differential Equations

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: 5

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: 189

A	B	C	D	E	FX
41,27	30,16	16,93	8,47	2,65	0,53

Lecturers: prof. RNDr. Daniel Ševčovič, DrSc., doc. RNDr. Mgr. Beáta Stehlíková, PhD.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-135/00	Pensions and Pension Funds

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: 2.

Educational level: II.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:
Three pillars of pension system: compulsory, supplementary, personal. Pension sytem in Slovakia. The pay-as-you-go system, system of funds. Defined benefit plans and defined contribution plans. Benefits not depending on previous earnings, depending on average salary or last salaries. One-time lump sum death benefit. Transfers. Funding plans. Pension funds investment.

Recommended literature:
Škrovánková L.: Penzijné a zdravotné poistenie, Ekonóm 1999
Škrovánková L., Bilíková M.: Penzijné a nemocenské poistenie, Ekonóm 2002
Lee E. M.: An Inroduction to Pension Schemes, Institute of Actuaries and Faculty of Actuaries 1986

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 27

A	B	C	D	E	FX
51,85	22,22	7,41	0,0	18,52	0,0

Lecturers: Mgr. Gábor Szűcs, PhD., doc. Mgr. Igor Melicherčík, PhD.

Last change: 12.01.2021

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KMANM/2-MMN-238/19	Performance Marketing

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: 2

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: 15

A	B	C	D	E	FX
33,33	46,67	13,33	6,67	0,0	0,0

Lecturers: Mgr. Ján Laurenčík

Last change: 06.02.2020

Approved by:

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: 1594

A	B	C	D	E	FX
98,56	0,56	0,06	0,0	0,0	0,82

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

Last change: 02.06.2015

Approved by:

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: 1458

A	B	C	D	E	FX
98,97	0,41	0,07	0,07	0,0	0,48

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

Last change: 02.06.2015

Approved by:

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: 1219

A	B	C	D	E	FX
99,02	0,41	0,0	0,0	0,0	0,57

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

Last change: 02.06.2015

Approved by:

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: 1056

A	B	C	D	E	FX
99,05	0,38	0,09	0,0	0,09	0,38

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

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-238/17	Political Economics

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: 78

A	B	C	D	E	FX
98,72	0,0	0,0	0,0	0,0	1,28

Lecturers: doc. RNDr. Ján Boďa, CSc.

Last change:

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-152/15	Principles of Mathematical Modelling in Science and Engineering

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: 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: 65

A	B	C	D	E	FX
49,23	21,54	10,77	6,15	3,08	9,23

Lecturers: doc. RNDr. Peter Guba, PhD.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-215/17	Quantitative Methods in Risk Management

Educational activities:
Type of activities: practicals / seminar
Number of hours:
per week: 1 / 2 **per level/semester:** 14 / 28
Form of the course: on-site learning

Number of credits: 4

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: 62

A	B	C	D	E	FX
38,71	24,19	20,97	8,06	0,0	8,06

Lecturers: Mgr. Ing. Pavol Jurča, PhD.

Last change:

Approved by:

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: 685

A	B	C	D	E	FX
58,98	16,35	10,51	4,53	1,9	7,74

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by:

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: 414

A	B	C	D	E	FX
65,94	15,22	8,7	3,86	0,97	5,31

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by:

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: 197

A	B	C	D	E	FX
70,05	17,77	8,63	2,54	0,0	1,02

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by:

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: 142

A	B	C	D	E	FX
75,35	13,38	7,04	2,82	0,7	0,7

Lecturers: PhDr. Elena Klátiková

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-140/19	SQL Databases

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: 5

Recommended semester: 3.

Educational level: II.

Prerequisites:

Antirequisites: FMFI.KAMŠ/2-EFM-140/15

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 159

A	B	C	D	E	FX
31,45	11,95	19,5	17,61	13,21	6,29

Lecturers: Ing. Alexander Šimko, PhD.

Last change:

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-143/17	Selected Actuarial Techniques

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: 2

Recommended semester: 2., 4.

Educational level: II.

Prerequisites:

Course requirements:
Preliminary assessment: individual work, individual assignments, project.
Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
After completing the course the student will master basic methods of work in life and non-life insurance in an international insurance company focusing on methods of cash-flow projection. He or she will be able to calculate actuarial and financial indicators.

Class syllabus:
Actuarial models in life insurance. Modelling the development of insurance contracts from the perspective of the client. Development of the number of insurance contracts with respect to the expected probability of death and lapse. Development of the mathematical reserves in the entire portfolio. Modelling of other variables affecting the profit of the insurance company. Modelling the future profits using the direct method. Modelling the future profits using the indirect method. Modelling of the present value of financial indicators. Impact of changes in assumptions on the profit of an insurance company.
Data preparation for modelling using the software R. Application of Generalized Linear Models (GLM) using the software R – selecting of appropriate parameters, presentation of results using R Shiny package.
Portfolio management in the insurance company using actuarial and financial indicators and relationships between them.

Recommended literature:
Zurich Insurance Company Ltd internal training materials

Languages necessary to complete the course:
Slovak, English

Notes:
Limit: maximum 25 students.
It is recommended to attend Exercises from Insurance Theory or any similar subject.

Past grade distribution Total number of evaluated students: 54					
A	B	C	D	E	FX
51,85	22,22	11,11	9,26	3,7	1,85
Lecturers: Mgr. Peter Cvacho, Mgr. Lukáš Kurinec, Mgr. Matej Breja, Ing. Pavel Gašpar, PhD.					
Last change: 24.08.2017					
Approved by:					

COURSE DESCRIPTION

University: Comenius University in Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAMŠ/2-EFM-143/17	**Course title:** Selected Actuarial Techniques
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: 2	
Recommended semester: 1., 3.	
Educational level: II.	
Prerequisites:	
Course requirements: Preliminary assessment: individual work, individual assignments, project. Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%. Scale of assessment (preliminary/final): 100/0	
Learning outcomes: After completing the course the student will master basic methods of work in life and non-life insurance in an international insurance company focusing on methods of cash-flow projection. He or she will be able to calculate actuarial and financial indicators.	
Class syllabus: Actuarial models in life insurance. Modelling the development of insurance contracts from the perspective of the client. Development of the number of insurance contracts with respect to the expected probability of death and lapse. Development of the mathematical reserves in the entire portfolio. Modelling of other variables affecting the profit of the insurance company. Modelling the future profits using the direct method. Modelling the future profits using the indirect method. Modelling of the present value of financial indicators. Impact of changes in assumptions on the profit of an insurance company. Data preparation for modelling using the software R. Application of Generalized Linear Models (GLM) using the software R – selecting of appropriate parameters, presentation of results using R Shiny package. Portfolio management in the insurance company using actuarial and financial indicators and relationships between them.	
Recommended literature: Zurich Insurance Company Ltd internal training materials	
Languages necessary to complete the course: Slovak, English	
Notes: Limit: maximum 25 students. It is recommended to attend Exercises from Insurance Theory or any similar subject.	

Past grade distribution
Total number of evaluated students: 54

A	B	C	D	E	FX
51,85	22,22	11,11	9,26	3,7	1,85

Lecturers: Mgr. Peter Cvacho, Jozef Kurinec, Mgr. Matej Breja, Ing. Pavel Gašpar, PhD.

Last change: 24.08.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-155/18	Social Network Analysis

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: 2

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: 36

A	B	C	D	E	FX
94,44	0,0	0,0	2,78	2,78	0,0

Lecturers: doc. RNDr. Mgr. Beáta Stehlíková, PhD.

Last change: 09.01.2019

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-123/15	Special Topics in Econometrics

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: 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: 0

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

Lecturers: doc. Mgr. Marián Grendár, PhD.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-115/17	Sports in Natur (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: 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: 68

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

Lecturers: Mgr. Branislav Nedbálek

Last change:

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KTV/2-MXX-116/18	Sports in Natur (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: 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: 35

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

Lecturers: Mgr. Branislav Nedbálek

Last change:

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-104/17	Stochastic Calculus and Its Applications

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: 5

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Written test during the semester;
Written exam
Scale of assessment (preliminary/final): 0/100

Learning outcomes:
Mastering the priciples of the Lebesgue integral theory, stochastic calculus and valuation of derivatives based on the Wiener process. The aim of the course is also to acquire key knowledge of classical methods of valuation of financial derivatives.

Class syllabus:
1. Theory of Lebesgue integral
2. Wiener process, Ito's integral, Ito's lemma
3. Black-Scholes model of pricing asset and currency derivatives
4. Models of interest rate development and pricing interest rate derivatives

Recommended literature:
Financial Calculus : An Introduction to derivate Pricing / Martin Baxter, Andrew Rennie. Cambridge : Cambridge University Press, 1996
Mathematical techniques in finance : Tools for incomplete markets / Aleš Černý. Princeton : Princeton University Press, 2009

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 107

A	B	C	D	E	FX
26,17	29,91	28,04	10,28	5,61	0,0

Lecturers: doc. Mgr. Igor Melicherčík, PhD.

Last change: 02.09.2020

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-103/00	Stochastic Methods of Operational Analysis

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: 2.

Educational level: II.

Prerequisites:

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

Learning outcomes:

Class syllabus:
Random chains, continuous and discrete Markov chains, Poisson process, Queueing theory (M/M/1, M/M/n, M/M/n/m, M/D/1), Inventory theory (basic deterministic and stochastic models). Newsvendor problem.

Recommended literature:
K. Janková, S. Kilianová, P. Brunovský, P. Bokes: Markovove reťazce a ich aplikácie. Epos, 2015
D. Gross, J. F. Shortle, J. M. Thompson C. M. Harris: Fundamentals of Queueing Theory, Fourth Edition. Wiley, 2008.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 493

A	B	C	D	E	FX
39,76	17,85	13,79	16,84	10,95	0,81

Lecturers: Mgr. Soňa Kilianová, PhD.

Last change: 24.10.2016

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-129/10	Stochastic Optimization Methods

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:

Recommended prerequisites:
2-PMS-123 Stochastic simulation methods

Course requirements:
Evaluation: project, oral exam
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 80/20

Learning outcomes:
Upon satisfactory completion of the course, students will be able to use selected optimization methods. The emphasize is put on heuristic methods of global optimization utilizing random elements (genetic algorithms, simulated annealing, particle swarm optimization, and so on).

Class syllabus:
Applications of linear programming in statistics. Algorithm Nelder-Mead. Simulated annealing. Genetic algorithms. Particle swarm optimization. Basics of constrained global optimization.

Recommended literature:
Algorithmics for hard problems : Introduction to combinatorial optimization, randomization, approximation, and heuristics / Juraj Hromkovič. Berlin : Springer, 2003
Spall JC: Introduction to stochastic search and optimization. Wiley, 2003
Online materials of the lecturer

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 162

A	B	C	D	E	FX
63,58	19,14	8,02	4,94	1,85	2,47

Lecturers: doc. Mgr. Radoslav Harman, PhD.

Last change: 08.05.2017
Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-PMS-123/10	Stochastic Simulation Methods

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: 1.

Educational level: II.

Prerequisites:

Course requirements:
Evaluation: project, oral examination
Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 80/20

Learning outcomes:
Upon satisfactory completion of the course, students will know basic methods of computer generation of random numbers, general random variables, and random vectors. The students will be able to use the random variates generation for Monte-Carlo sampling, and for the evaluation of complex stochastic systems.

Class syllabus:
Generating realizations of random numbers, random variables and random vectors. Statistical analysis of simulation data. Basic Monte Carlo methods.

Recommended literature:
Ross S: Simulation, Elsevier Academic Press 2006
Fishman GS: Monte Carlo: Concepts, Algorithms and Applications, Springer 1996
Online materials of the lecturer

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 370

A	B	C	D	E	FX
41,89	23,51	15,14	9,19	6,49	3,78

Lecturers: doc. Mgr. Radoslav Harman, PhD.

Last change: 08.05.2017

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-239/18	Theory of Evolutional Games

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: 2

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: 2

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

Lecturers: doc. RNDr. Ján Pekár, PhD.

Last change: 03.02.2021

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-105/00	Theory of Non-Cooperative Games

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:
Scale of assessment (preliminary/final): 40/60

Learning outcomes:

Class syllabus:
Bayes games, Bayes-Nash equilibrium. Dynamic games with incomplete information. Four Bayes assumptions. Sequential equilibrium. Weak perfect Bayes equilibrium. Perfect Bayes equilibrium.

Recommended literature:
Mas-Collel, Whinston, Green: Microeconomic Analysis. Oxford University Press, 1995

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 462

A	B	C	D	E	FX
53,25	16,45	16,02	7,79	6,06	0,43

Lecturers: doc. RNDr. Ján Pekár, PhD.

Last change: 17.06.2015

Approved by:

COURSE DESCRIPTION

University: Comenius University in Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAMŠ/2-EFM-102/15	Time Series Analysis

Educational activities:
Type of activities: lecture / practicals
Number of hours:
per week: 2 / 1 **per level/semester:** 28 / 14
Form of the course: on-site learning

Number of credits: 4

Recommended semester: 1.

Educational level: II.

Prerequisites:

Course requirements:
Assessment (preliminary/final): 100/0
Preliminary assessment: homework, test
Written exam
Final assessment: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Practice and enhancement of the topics from the Time series course.

Class syllabus:
Bass model: modeling a new product on a market. ARIMA modelling: theoretical examples and analysis of real data. Modelling trend: exponential smoothing, Holt-Winters method, Hodrick-Prescott filter. Modelling volatility: application to measuring risk, value at risk

Recommended literature:
G. Kirchgässner, J. Wolters: Introduction to Modern Time Series Analysis. Springer, 2008.
W. Enders: Applied Econometric Time Series. John Wiley & Sons, 1995.
A. Pankratz: Forecasting with Univariate Box-Jenskins Models: Concepts and Cases. John Wiley & Sons, 1983.
R. H. Shumway, D. S. Stoffer: Time Series Analysis and Its Applications: With R Examples, 3rd edition. Springer, 2010.
P. S. P.Cowpertwait, A. V. Metcalfe: Introductory Time Series with R. Springer, 2009.

Languages necessary to complete the course:
Slovak, English

Notes:

Past grade distribution
Total number of evaluated students: 175

A	B	C	D	E	FX
34,86	29,14	23,43	8,0	3,43	1,14

Lecturers: doc. RNDr. Mgr. Beáta Stehlíková, PhD.
Last change: 04.04.2017
Approved by: