

## Course descriptions

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## COURSE DESCRIPTION

|  |       |   |       |       |      |
|--|-------|---|-------|-------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |       |       |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |       |       |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-213/00  |       | <b>Course title:</b><br>Bayesian Statistics |       |       |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |       |       |      |
| <b>Number of credits:</b> 3  |       |   |       |       |      |
| <b>Recommended semester:</b> 3.  |       |   |       |       |      |
| <b>Educational level:</b> II.  |       |   |       |       |      |
| <b>Prerequisites:</b> FMFI.KAMŠ/2-PMS-107/15 - Regression Models   |       |   |       |       |      |
| <b>Course requirements:</b><br>Preliminary semester evaluation: homeworks, test<br>Examination: oral examination<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%  |       |   |       |       |      |
| <b>Learning outcomes:</b><br>Students will understand roots and modern tools of Bayesian statistics. They will be able to perform calculations based on Bayesian methods for statistical decisions in various situations.  |       |   |       |       |      |
| <b>Class syllabus:</b><br>: Bayes theorem, properties of the posterior probability, I-divergence and the information contained in an experiment, non-informative priors (different approaches), conjugate priors, MCMC methods, statistical decision rules, Bayes estimators in general and in particular in linear models, Bayes conception of testing hypotheses and of interval estimation. |       |   |       |       |      |
| <b>Recommended literature:</b><br>Pázman: Bayesovská štatistika.<br>Pázman: Teória hier a štatistického rozhodovania.<br>Andel: Matematická štatistika.  |       |   |       |       |      |
| <b>Languages necessary to complete the course:</b>   |       |   |       |       |      |
| <b>Notes:</b>  |       |   |       |       |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 153  |       |   |       |       |      |
| A  | B     | C   | D     | E     | FX   |
| 16,99  | 18,95 | 28,1  | 19,61 | 14,38 | 1,96 |
| <b>Lecturers:</b> prof. RNDr. Andrej Pázman, DrSc.   |       |   |       |       |      |
| <b>Last change:</b> 02.05.2017   |       |   |       |       |      |

**Approved by:** prof. RNDr. Marek Fila, DrSc.

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|  |       |   |     |      |     |
|--|-------|---|-----|------|-----|
| <b>University:</b> Comenius University in Bratislava   |       |   |     |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |     |      |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-130/10  |       | <b>Course title:</b><br>Categorical Data Analysis |     |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |   |     |      |     |
| <b>Number of credits:</b> 3  |       |   |     |      |     |
| <b>Recommended semester:</b> 3.  |       |   |     |      |     |
| <b>Educational level:</b> II.  |       |   |     |      |     |
| <b>Prerequisites:</b>  |       |   |     |      |     |
| <b>Course requirements:</b>  |       |   |     |      |     |
| <b>Learning outcomes:</b>  |       |   |     |      |     |
| <b>Class syllabus:</b>   |       |   |     |      |     |
| <b>Recommended literature:</b>   |       |   |     |      |     |
| <b>Languages necessary to complete the course:</b>   |       |   |     |      |     |
| <b>Notes:</b>  |       |   |     |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 109  |       |   |     |      |     |
| A  | B     | C   | D   | E    | FX  |
| 50,46  | 30,28 | 9,17  | 5,5 | 4,59 | 0,0 |
| <b>Lecturers:</b> doc. Mgr. Ján Mačutek, PhD.  |       |   |     |      |     |
| <b>Last change:</b> 02.06.2015   |       |   |     |      |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |     |      |     |

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|  |       |   |      |      |      |
|--|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-109/15  |       | <b>Course title:</b><br>Computer Statistics |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |   |      |      |      |
| <b>Number of credits:</b> 3  |       |   |      |      |      |
| <b>Recommended semester:</b> 2.  |       |   |      |      |      |
| <b>Educational level:</b> II.  |       |   |      |      |      |
| <b>Prerequisites:</b>  |       |   |      |      |      |
| <b>Course requirements:</b>  |       |   |      |      |      |
| <b>Learning outcomes:</b>  |       |   |      |      |      |
| <b>Class syllabus:</b>   |       |   |      |      |      |
| <b>Recommended literature:</b>   |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>   |       |   |      |      |      |
| <b>Notes:</b>  |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 129  |       |   |      |      |      |
| A  | B     | C   | D    | E    | FX   |
| 67,44  | 19,38 | 9,3   | 1,55 | 1,55 | 0,78 |
| <b>Lecturers:</b> Mgr. Ján Somorčík, PhD.  |       |   |      |      |      |
| <b>Last change:</b> 12.10.2016   |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |      |      |      |

## COURSE DESCRIPTION

|   |      |   |     |     |     |
|---|------|---|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava  |      |   |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |      |   |     |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-EFM-113/18   |      | <b>Course title:</b><br>Databases and Data Analysis |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |      |   |     |     |     |
| <b>Number of credits:</b> 3   |      |   |     |     |     |
| <b>Recommended semester:</b> 2.   |      |   |     |     |     |
| <b>Educational level:</b> II.   |      |   |     |     |     |
| <b>Prerequisites:</b>   |      |   |     |     |     |
| <b>Antirequisites:</b> FMFI.KAMŠ/2-EFM-113/17   |      |   |     |     |     |
| <b>Course requirements:</b>   |      |   |     |     |     |
| <b>Learning outcomes:</b>   |      |   |     |     |     |
| <b>Class syllabus:</b>  |      |   |     |     |     |
| <b>Recommended literature:</b>  |      |   |     |     |     |
| <b>Languages necessary to complete the course:</b>  |      |   |     |     |     |
| <b>Notes:</b>   |      |   |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 5   |      |   |     |     |     |
| A   | B    | C   | D   | E   | FX  |
| 40,0  | 40,0 | 20,0  | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Stanislav Sekereš  |      |   |     |     |     |
| <b>Last change:</b> 12.12.2018  |      |   |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |      |   |     |     |     |

## COURSE DESCRIPTION

|  |      |   |      |     |      |
|--|------|---|------|-----|------|
| <b>University:</b> Comenius University in Bratislava   |      |   |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |   |      |     |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-EFM-237/15  |      | <b>Course title:</b><br>Digital Signal Processing |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |      |   |      |     |      |
| <b>Number of credits:</b> 3  |      |   |      |     |      |
| <b>Recommended semester:</b> 4.  |      |   |      |     |      |
| <b>Educational level:</b> II.  |      |   |      |     |      |
| <b>Prerequisites:</b>  |      |   |      |     |      |
| <b>Course requirements:</b>  |      |   |      |     |      |
| <b>Learning outcomes:</b>  |      |   |      |     |      |
| <b>Class syllabus:</b>   |      |   |      |     |      |
| <b>Recommended literature:</b>   |      |   |      |     |      |
| <b>Languages necessary to complete the course:</b>   |      |   |      |     |      |
| <b>Notes:</b>  |      |   |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 48   |      |   |      |     |      |
| A  | B    | C   | D    | E   | FX   |
| 77,08  | 12,5 | 6,25  | 2,08 | 0,0 | 2,08 |
| <b>Lecturers:</b> Mgr. Soňa Kilianová, PhD.  |      |   |      |     |      |
| <b>Last change:</b> 02.06.2015   |      |   |      |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |   |      |     |      |



## STATE EXAM DESCRIPTION

|   |  |
|---|--|
| <b>University:</b> Comenius University in Bratislava            |  |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |  |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-991/15                     | <b>Course title:</b><br>Diploma Thesis |
| <b>Number of credits:</b> 15                                    |  |
| <b>Recommended semester:</b> 3., 4..                            |  |
| <b>Educational level:</b> II.                                   |  |
| <b>State exam syllabus:</b>                                     |  |
| <b>Last change:</b> 02.06.2015                                  |  |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.               |  |

## COURSE DESCRIPTION

|  |      |                                      |       |      |      |
|--|------|--------------------------------------|-------|------|------|
| <b>University:</b> Comenius University in Bratislava   |      |                                      |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |                                      |       |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/1-EFM-380/00  |      | <b>Course title:</b><br>Econometrics |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning   |      |                                      |       |      |      |
| <b>Number of credits:</b> 5  |      |                                      |       |      |      |
| <b>Recommended semester:</b> 2.  |      |                                      |       |      |      |
| <b>Educational level:</b> I., II.  |      |                                      |       |      |      |
| <b>Prerequisites:</b> FMFI.KAMŠ/1-EFM-330/00 - Statistical Methods or FMFI.KAMŠ/2-MMN-106/15 - Computer Statistics or FMFI.KAMŠ/2-PMS-107/15 - Regression Models or FMFI.KAMŠ/2-MMN-106/15 - Computer Statistics   |      |                                      |       |      |      |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 30/70  |      |                                      |       |      |      |
| <b>Learning outcomes:</b>  |      |                                      |       |      |      |
| <b>Class syllabus:</b><br>General framework of model building in the applications. Classical linear regression model. Methods of parameter estimation and their properties. Ordinary Least Squares method and theory. Regression diagnostics. Stochastic specification and classical assumptions of the linear regression model. Inference in the linear regression model. Violating assumptions in the classical linear regression model, detection and correction: heteroskedasticity and autocorrelation. Generalized least squares method. Multikollinearity. Stochastic regressors, autoregression. Instrumental variables method. Introduction to simultaneous equations. Qualitative variables, logistic regression. Overview of other methods. |      |                                      |       |      |      |
| <b>Recommended literature:</b><br>Faraway, J. J., Linear models with R, Chapman&Hall/CRC, 2005.<br>Johnston, J. and DiNardo, J., Econometric methods, McGraw&Hill, 4-th. ed, 1997.   |      |                                      |       |      |      |
| <b>Languages necessary to complete the course:</b>   |      |                                      |       |      |      |
| <b>Notes:</b>  |      |                                      |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1032   |      |                                      |       |      |      |
| A  | B    | C                                    | D     | E    | FX   |
| 24,22  | 15,5 | 18,9                                 | 17,64 | 18,6 | 5,14 |
| <b>Lecturers:</b> Mgr. Ján Somorčík, PhD., Mgr. Samuel Rosa, PhD.  |      |                                      |       |      |      |
| <b>Last change:</b> 12.10.2016   |      |                                      |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |                                      |       |      |      |

## COURSE DESCRIPTION

|   |       |   |      |      |      |
|---|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-233/13  |       | <b>Course title:</b><br>English Conversation Course (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |      |      |      |
| <b>Number of credits:</b> 2   |       |   |      |      |      |
| <b>Recommended semester:</b> 1., 3.   |       |   |      |      |      |
| <b>Educational level:</b> I., II.   |       |   |      |      |      |
| <b>Prerequisites:</b>   |       |   |      |      |      |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 100/0   |       |   |      |      |      |
| <b>Learning outcomes:</b>   |       |   |      |      |      |
| <b>Class syllabus:</b><br>The content of the course is general English.<br>The language level is B2/C1 (Upper-Intermediate/Lower Advanced).   |       |   |      |      |      |
| <b>Recommended literature:</b><br>Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals<br>Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings) |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>  |       |   |      |      |      |
| <b>Notes:</b>   |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 144   |       |   |      |      |      |
| A   | B     | C   | D    | E    | FX   |
| 59,72   | 18,06 | 9,03  | 2,08 | 1,39 | 9,72 |
| <b>Lecturers:</b> PhDr. Elena Klátiková   |       |   |      |      |      |
| <b>Last change:</b> 02.06.2015  |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |      |      |      |

## COURSE DESCRIPTION

|   |       |   |      |     |      |
|---|-------|---|------|-----|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |      |     |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-234/13  |       | <b>Course title:</b><br>English Conversation Course (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |      |     |      |
| <b>Number of credits:</b> 2   |       |   |      |     |      |
| <b>Recommended semester:</b> 2., 4.   |       |   |      |     |      |
| <b>Educational level:</b> I., II.   |       |   |      |     |      |
| <b>Prerequisites:</b>   |       |   |      |     |      |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 100/0   |       |   |      |     |      |
| <b>Learning outcomes:</b>   |       |   |      |     |      |
| <b>Class syllabus:</b><br>The course is a follow-up to the Conversation Course in English (1). The content of the course is general English.<br>The language level is B2/C1 (Upper-Intermediate/Lower Advanced).  |       |   |      |     |      |
| <b>Recommended literature:</b><br>Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals<br>Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings) |       |   |      |     |      |
| <b>Languages necessary to complete the course:</b>  |       |   |      |     |      |
| <b>Notes:</b>   |       |   |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 78  |       |   |      |     |      |
| A   | B     | C   | D    | E   | FX   |
| 64,1  | 20,51 | 6,41  | 1,28 | 0,0 | 7,69 |
| <b>Lecturers:</b> PhDr. Elena Klátiková   |       |   |      |     |      |
| <b>Last change:</b> 02.06.2015  |       |   |      |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |      |     |      |

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|  |       |   |      |      |      |
|--|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-EFM-153/17  |       | <b>Course title:</b><br>Finance and Insurance in Practice (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |      |      |      |
| <b>Number of credits:</b> 2  |       |   |      |      |      |
| <b>Recommended semester:</b> 1., 3.  |       |   |      |      |      |
| <b>Educational level:</b> II.  |       |   |      |      |      |
| <b>Prerequisites:</b>  |       |   |      |      |      |
| <b>Course requirements:</b><br>Preliminary assessment: active participation in seminars, solving tasks during workshops, individual work<br>Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 100/0  |       |   |      |      |      |
| <b>Learning outcomes:</b><br>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.  |       |   |      |      |      |
| <b>Class syllabus:</b><br>Basic financial and insurance segments. Banks and insurance companies - joint-stock companies and their legislative background.<br>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.<br>Professional software used in financial and insurance practice. |       |   |      |      |      |
| <b>Recommended literature:</b><br>Poist'ovníctvo / Anna Majtánová a kolektív. Bratislava : Wolters Kluwer (Iura Edition), 2009   |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b><br>Slovak, English  |       |   |      |      |      |
| <b>Notes:</b>  |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 70   |       |   |      |      |      |
| A  | B     | C   | D    | E    | FX   |
| 78,57  | 15,71 | 1,43  | 1,43 | 1,43 | 1,43 |
| <b>Lecturers:</b> Mgr. Gábor Szűcs, PhD.   |       |   |      |      |      |
| <b>Last change:</b> 12.09.2017   |       |   |      |      |      |

**Approved by:** prof. RNDr. Marek Fila, DrSc.

## COURSE DESCRIPTION

|  |       |   |      |     |      |
|--|-------|---|------|-----|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |     |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-EFM-154/17  |       | <b>Course title:</b><br>Finance and Insurance in Practice (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |      |     |      |
| <b>Number of credits:</b> 2  |       |   |      |     |      |
| <b>Recommended semester:</b> 2., 4.  |       |   |      |     |      |
| <b>Educational level:</b> II.  |       |   |      |     |      |
| <b>Prerequisites:</b>  |       |   |      |     |      |
| <b>Course requirements:</b><br>Preliminary assessment: active participation in seminars, solving tasks during workshops, individual work<br>Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 100/0  |       |   |      |     |      |
| <b>Learning outcomes:</b><br>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.  |       |   |      |     |      |
| <b>Class syllabus:</b><br>Basic financial and insurance segments. Actuarial model development in life and non-life insurance. Financial modelling.<br>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.<br>Professional software used in financial and insurance practice. |       |   |      |     |      |
| <b>Recommended literature:</b><br>Poist'ovníctvo / Anna Majtánová a kolektív. Bratislava : Wolters Kluwer (Iura Edition), 2009   |       |   |      |     |      |
| <b>Languages necessary to complete the course:</b><br>Slovak, English  |       |   |      |     |      |
| <b>Notes:</b>  |       |   |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 54   |       |   |      |     |      |
| A  | B     | C   | D    | E   | FX   |
| 75,93  | 11,11 | 9,26  | 1,85 | 0,0 | 1,85 |
| <b>Lecturers:</b> Mgr. Gábor Szűcs, PhD.   |       |   |      |     |      |
| <b>Last change:</b> 12.09.2017   |       |   |      |     |      |

**Approved by:** prof. RNDr. Marek Fila, DrSc.



## COURSE DESCRIPTION

|   |       |   |      |      |      |
|---|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-141/00  |       | <b>Course title:</b><br>French Language (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |      |      |      |
| <b>Number of credits:</b> 2   |       |   |      |      |      |
| <b>Recommended semester:</b> 1.   |       |   |      |      |      |
| <b>Educational level:</b> I., II.   |       |   |      |      |      |
| <b>Prerequisites:</b>   |       |   |      |      |      |
| <b>Course requirements:</b>   |       |   |      |      |      |
| <b>Learning outcomes:</b>   |       |   |      |      |      |
| <b>Class syllabus:</b><br>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. |       |   |      |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2   |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>  |       |   |      |      |      |
| <b>Notes:</b>   |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 387   |       |   |      |      |      |
| A   | B     | C   | D    | E    | FX   |
| 41,09   | 21,96 | 21,19                                       | 9,82 | 2,07 | 3,88 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová  |       |   |      |      |      |
| <b>Last change:</b> 02.06.2015  |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |      |      |      |

## COURSE DESCRIPTION

|   |       |   |       |      |      |
|---|-------|---|-------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |       |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-142/00  |       | <b>Course title:</b><br>French Language (2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |       |      |      |
| <b>Number of credits:</b> 2   |       |   |       |      |      |
| <b>Recommended semester:</b> 2.   |       |   |       |      |      |
| <b>Educational level:</b> I., II.   |       |   |       |      |      |
| <b>Prerequisites:</b>   |       |   |       |      |      |
| <b>Course requirements:</b>   |       |   |       |      |      |
| <b>Learning outcomes:</b>   |       |   |       |      |      |
| <b>Class syllabus:</b><br>The subject continues the program of French language (1) and provides courses of essential and intermediate French language.  |       |   |       |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2<br>Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983<br>Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008 |       |   |       |      |      |
| <b>Languages necessary to complete the course:</b>  |       |   |       |      |      |
| <b>Notes:</b>   |       |   |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 247   |       |   |       |      |      |
| A   | B     | C   | D     | E    | FX   |
| 36,03   | 26,72 | 21,05                                       | 10,93 | 2,83 | 2,43 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová  |       |   |       |      |      |
| <b>Last change:</b> 02.06.2015  |       |   |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |       |      |      |

## COURSE DESCRIPTION

|   |       |   |      |      |      |
|---|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-241/00  |       | <b>Course title:</b><br>French Language (3) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |      |      |      |
| <b>Number of credits:</b> 2   |       |   |      |      |      |
| <b>Recommended semester:</b> 3.   |       |   |      |      |      |
| <b>Educational level:</b> I., II.   |       |   |      |      |      |
| <b>Prerequisites:</b>   |       |   |      |      |      |
| <b>Course requirements:</b>   |       |   |      |      |      |
| <b>Learning outcomes:</b>   |       |   |      |      |      |
| <b>Class syllabus:</b><br>The subject provides a course of intermediate French language, covering not only general, but also technical language.  |       |   |      |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2<br>Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983<br>Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008 |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>  |       |   |      |      |      |
| <b>Notes:</b>   |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 97  |       |   |      |      |      |
| A   | B     | C   | D    | E    | FX   |
| 36,08   | 28,87 | 22,68                                       | 7,22 | 1,03 | 4,12 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová  |       |   |      |      |      |
| <b>Last change:</b> 02.06.2015  |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |      |      |      |

## COURSE DESCRIPTION

|  |       |   |      |      |      |
|--|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-242/00   |       | <b>Course title:</b><br>French Language (4) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |       |   |      |      |      |
| <b>Number of credits:</b> 2  |       |   |      |      |      |
| <b>Recommended semester:</b> 4.  |       |   |      |      |      |
| <b>Educational level:</b> I., II.  |       |   |      |      |      |
| <b>Prerequisites:</b>  |       |   |      |      |      |
| <b>Course requirements:</b>  |       |   |      |      |      |
| <b>Learning outcomes:</b>  |       |   |      |      |      |
| <b>Class syllabus:</b><br>The subject provides a course of intermediate French covering not only general, but also technical French language.  |       |   |      |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2<br>Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983<br>Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008<br>Zarha Lahmidi: Sciences-techniques.com, ISBN 209-0331186-0, CLE international, 2005 |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>   |       |   |      |      |      |
| <b>Notes:</b>  |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 68   |       |   |      |      |      |
| A  | B     | C   | D    | E    | FX   |
| 36,76  | 35,29 | 19,12                                       | 2,94 | 1,47 | 4,41 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová   |       |   |      |      |      |
| <b>Last change:</b> 02.06.2015   |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |      |      |      |

## COURSE DESCRIPTION

|  |       |   |      |      |      |
|--|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-151/00   |       | <b>Course title:</b><br>German Language (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |       |   |      |      |      |
| <b>Number of credits:</b> 2  |       |   |      |      |      |
| <b>Recommended semester:</b> 1.  |       |   |      |      |      |
| <b>Educational level:</b> I., II.  |       |   |      |      |      |
| <b>Prerequisites:</b>  |       |   |      |      |      |
| <b>Course requirements:</b>  |       |   |      |      |      |
| <b>Learning outcomes:</b>  |       |   |      |      |      |
| <b>Class syllabus:</b><br>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. |       |   |      |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.   |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>   |       |   |      |      |      |
| <b>Notes:</b>  |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 666  |       |   |      |      |      |
| A  | B     | C   | D    | E    | FX   |
| 32,28  | 29,13 | 21,17                                       | 9,91 | 2,85 | 4,65 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič  |       |   |      |      |      |
| <b>Last change:</b> 02.06.2015   |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |      |      |      |

## COURSE DESCRIPTION

|   |       |   |       |      |      |
|---|-------|---|-------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |       |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-152/00  |       | <b>Course title:</b><br>German Language (2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |   |       |      |      |
| <b>Number of credits:</b> 2   |       |   |       |      |      |
| <b>Recommended semester:</b> 2.   |       |   |       |      |      |
| <b>Educational level:</b> I., II.   |       |   |       |      |      |
| <b>Prerequisites:</b>   |       |   |       |      |      |
| <b>Course requirements:</b>   |       |   |       |      |      |
| <b>Learning outcomes:</b>   |       |   |       |      |      |
| <b>Class syllabus:</b><br>The course continues the program of German language (1). German language is taught at three levels: beginner, intermediate, advanced.                                       |       |   |       |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.  |       |   |       |      |      |
| <b>Languages necessary to complete the course:</b>  |       |   |       |      |      |
| <b>Notes:</b>   |       |   |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 423   |       |   |       |      |      |
| A   | B     | C   | D     | E    | FX   |
| 30,5  | 21,99 | 22,93                                       | 14,66 | 3,78 | 6,15 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič   |       |   |       |      |      |
| <b>Last change:</b> 02.06.2015  |       |   |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |       |      |      |

## COURSE DESCRIPTION

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|--|------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava   |      |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-251/00   |      | <b>Course title:</b><br>German Language (3) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                            |      |   |      |      |      |
| <b>Number of credits:</b> 2  |      |   |      |      |      |
| <b>Recommended semester:</b> 3.  |      |   |      |      |      |
| <b>Educational level:</b> I., II.  |      |   |      |      |      |
| <b>Prerequisites:</b>  |      |   |      |      |      |
| <b>Course requirements:</b>  |      |   |      |      |      |
| <b>Learning outcomes:</b>  |      |   |      |      |      |
| <b>Class syllabus:</b><br>The subject continues the program of German language (2). It provides a course of intermediate and advanced German language.   |      |   |      |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.<br>Aus moderner Technik und Naturwissenschaft, 1999, Max Hueber Verlag, D-85737, ISBN 3-19-001629-1 |      |   |      |      |      |
| <b>Languages necessary to complete the course:</b>   |      |   |      |      |      |
| <b>Notes:</b>  |      |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 150  |      |   |      |      |      |
| A  | B    | C   | D    | E    | FX   |
| 38,0   | 28,0 | 22,0  | 6,67 | 2,67 | 2,67 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič  |      |   |      |      |      |
| <b>Last change:</b> 02.06.2015   |      |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |   |      |      |      |

## COURSE DESCRIPTION

|   |       |   |       |      |      |
|---|-------|---|-------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |       |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-252/00  |       | <b>Course title:</b><br>German Language (4) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |   |       |      |      |
| <b>Number of credits:</b> 2   |       |   |       |      |      |
| <b>Recommended semester:</b> 4.   |       |   |       |      |      |
| <b>Educational level:</b> I., II.   |       |   |       |      |      |
| <b>Prerequisites:</b>   |       |   |       |      |      |
| <b>Course requirements:</b>   |       |   |       |      |      |
| <b>Learning outcomes:</b>   |       |   |       |      |      |
| <b>Class syllabus:</b><br>The subject continues the program of German language (3). It provides a course of intermediate and advanced German language.  |       |   |       |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.<br>Vilma Václavíková: Nemčina pre študentov MFF UK, Vysokoškolský učebný text pre potrebu študentov KJP, č. 9793/1982 C VIII/2, 1983 |       |   |       |      |      |
| <b>Languages necessary to complete the course:</b>  |       |   |       |      |      |
| <b>Notes:</b>   |       |   |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 78  |       |   |       |      |      |
| A   | B     | C   | D     | E    | FX   |
| 35,9  | 28,21 | 14,1  | 12,82 | 3,85 | 5,13 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič   |       |   |       |      |      |
| <b>Last change:</b> 02.06.2015  |       |   |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |       |      |      |



## COURSE DESCRIPTION

|   |       |   |      |     |     |
|---|-------|---|------|-----|-----|
| <b>University:</b> Comenius University in Bratislava  |       |   |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |      |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-915/17   |       | <b>Course title:</b><br>Individual Work on Diploma Thesis |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> independent work<br><b>Number of hours:</b><br><b>per week:</b> 25 <b>per level/semester:</b> 350<br><b>Form of the course:</b> on-site learning |       |   |      |     |     |
| <b>Number of credits:</b> 12  |       |   |      |     |     |
| <b>Recommended semester:</b> 3.   |       |   |      |     |     |
| <b>Educational level:</b> II.   |       |   |      |     |     |
| <b>Prerequisites:</b>   |       |   |      |     |     |
| <b>Course requirements:</b>   |       |   |      |     |     |
| <b>Learning outcomes:</b>   |       |   |      |     |     |
| <b>Class syllabus:</b>  |       |   |      |     |     |
| <b>Recommended literature:</b>  |       |   |      |     |     |
| <b>Languages necessary to complete the course:</b>  |       |   |      |     |     |
| <b>Notes:</b>   |       |   |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 57  |       |   |      |     |     |
| A   | B     | C   | D    | E   | FX  |
| 71,93   | 22,81 | 3,51  | 1,75 | 0,0 | 0,0 |
| <b>Lecturers:</b>   |       |   |      |     |     |
| <b>Last change:</b>   |       |   |      |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |      |     |     |

## COURSE DESCRIPTION

|   |      |   |     |     |     |
|---|------|---|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava  |      |   |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |      |   |     |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-132/15   |      | <b>Course title:</b><br>Insurance Risk Assessment |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |      |   |     |     |     |
| <b>Number of credits:</b> 3   |      |   |     |     |     |
| <b>Recommended semester:</b> 2.   |      |   |     |     |     |
| <b>Educational level:</b> II.   |      |   |     |     |     |
| <b>Prerequisites:</b>   |      |   |     |     |     |
| <b>Course requirements:</b><br>Preliminary assessment: test during the semester<br>Final assessment: test at the end of the semester<br>Scale of assessment (preliminary/final): 80/20  |      |   |     |     |     |
| <b>Learning outcomes:</b><br>After completing the course, the student will master the pillars of the regulatory regime Solvency II.<br>The student should also know the principles of risk capital calculation and reporting under Solvency II.   |      |   |     |     |     |
| <b>Class syllabus:</b><br>Three pillar structure of the Solvency II: Pillar 1, Pillar 2, Pillar 3. Current legislation regulating the principles of calculating and reporting risk capital under Pillar 1. Own Risk and Solvency Assessment (ORSA) based on Pillar 2.   |      |   |     |     |     |
| <b>Recommended literature:</b><br>Directive 2009/138/EC of the European Parliament and of the Council on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)<br>Act No 39/2015 of the National Council of the Slovak Republic on insurance and amending certain laws<br>EIOPA-14/209 Technical Specification for the Preparatory Phase<br>EIOPA-14-322 The underlying assumptions in the standard formula for the Solvency Capital Requirement calculation |      |   |     |     |     |
| <b>Languages necessary to complete the course:</b><br>Slovak, English   |      |   |     |     |     |
| <b>Notes:</b>   |      |   |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 4   |      |   |     |     |     |
| A   | B    | C   | D   | E   | FX  |
| 25,0  | 75,0 | 0,0   | 0,0 | 0,0 | 0,0 |

|   |
|---|
| <b>Lecturers:</b> Mgr. Miroslava Mikulová, Mgr. Rastislav Noška |
| <b>Last change:</b> 07.09.2017                                  |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.               |

## COURSE DESCRIPTION

|  |       |   |      |     |     |
|--|-------|---|------|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-MAT-114/15  |       | <b>Course title:</b><br>Integral Transforms and Special Functions |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |   |      |     |     |
| <b>Number of credits:</b> 3  |       |   |      |     |     |
| <b>Recommended semester:</b> 3.  |       |   |      |     |     |
| <b>Educational level:</b> II.  |       |   |      |     |     |
| <b>Prerequisites:</b>  |       |   |      |     |     |
| <b>Course requirements:</b>  |       |   |      |     |     |
| <b>Learning outcomes:</b>  |       |   |      |     |     |
| <b>Class syllabus:</b>   |       |   |      |     |     |
| <b>Recommended literature:</b>   |       |   |      |     |     |
| <b>Languages necessary to complete the course:</b>   |       |   |      |     |     |
| <b>Notes:</b>  |       |   |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 23   |       |   |      |     |     |
| A  | B     | C   | D    | E   | FX  |
| 47,83  | 21,74 | 8,7   | 4,35 | 8,7 | 8,7 |
| <b>Lecturers:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |      |     |     |
| <b>Last change:</b> 02.06.2015   |       |   |      |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |      |     |     |

## COURSE DESCRIPTION

|   |       |  |       |      |      |
|---|-------|--|-------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |       |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-118/10   |       | <b>Course title:</b><br>Markov Processes (1) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning  |       |  |       |      |      |
| <b>Number of credits:</b> 5   |       |  |       |      |      |
| <b>Recommended semester:</b> 1.   |       |  |       |      |      |
| <b>Educational level:</b> II.   |       |  |       |      |      |
| <b>Prerequisites:</b>   |       |  |       |      |      |
| <b>Course requirements:</b><br>Preliminary semester evaluation: test and homeworks<br>Examination: written examination<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%   |       |  |       |      |      |
| <b>Learning outcomes:</b><br>After completing the course the student will master elementary discrete time Markov chains models.<br>He will be able to classify states of a Markov chain and calculate stationary probability distributions.   |       |  |       |      |      |
| <b>Class syllabus:</b><br>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, absorption probabilities, mean time to absorption. Markov reward chains algorithms and Markov Chain Monte Carlo. |       |  |       |      |      |
| <b>Recommended literature:</b><br>Kalas, J: Markovove reťazce, skriptá MFF UK<br>Norris, J.R.: Markov chains (1998)<br>Ross, S.M.: Introduction to probability models (2006)  |       |  |       |      |      |
| <b>Languages necessary to complete the course:</b>  |       |  |       |      |      |
| <b>Notes:</b>   |       |  |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 193   |       |  |       |      |      |
| A   | B     | C  | D     | E    | FX   |
| 22,8  | 19,17 | 25,91  | 22,28 | 8,29 | 1,55 |
| <b>Lecturers:</b> doc. RNDr. Katarína Janková, CSc., doc. Mgr. Pavol Bokes, PhD.  |       |  |       |      |      |
| <b>Last change:</b> 02.05.2017  |       |  |       |      |      |

**Approved by:** prof. RNDr. Marek Fila, DrSc.

## COURSE DESCRIPTION

|  |       |   |       |      |      |
|--|-------|---|-------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |       |      |      |
| <b>Course ID:</b><br>FMFL.KAMŠ/2-PMS-119/15  |       | <b>Course title:</b><br>Markov Processes(2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14<br><b>Form of the course:</b> on-site learning   |       |   |       |      |      |
| <b>Number of credits:</b> 5  |       |   |       |      |      |
| <b>Recommended semester:</b> 2.  |       |   |       |      |      |
| <b>Educational level:</b> II.  |       |   |       |      |      |
| <b>Prerequisites:</b>  |       |   |       |      |      |
| <b>Course requirements:</b>  |       |   |       |      |      |
| <b>Learning outcomes:</b><br>After completing the course students will know properties of homogeneous Markov chains with continuous time. They will be able to use models based on these chains.   |       |   |       |      |      |
| <b>Class syllabus:</b><br>Markov property for continuous time chains, probabilities of transition, initial distribution, Chapman Kolmogorov equation. Forces of transition and their properties, backward and forward systems of Kolmogorov differential equations. Stationary and ergodic distribution of the chain. Models of linear growth, birth and death chains, Poisson process. Characterization of processes using jump chain and holding times. Queueing systems: M/M/n, M/M/infinity. Imbedded chain technique for M/G/1. Pollaczek Chinchin formula. |       |   |       |      |      |
| <b>Recommended literature:</b><br>Janková, K., Kilianová, S., Brunovský, P., Bokes, P.: Markovove reťazce a ich aplikácie. Epos 2014.<br>Norris, J.:Markov Chains.Cambridge University Press 1997.   |       |   |       |      |      |
| <b>Languages necessary to complete the course:</b>   |       |   |       |      |      |
| <b>Notes:</b>  |       |   |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 59   |       |   |       |      |      |
| A  | B     | C   | D     | E    | FX   |
| 23,73  | 13,56 | 30,51                                       | 23,73 | 5,08 | 3,39 |
| <b>Lecturers:</b> doc. RNDr. Katarína Janková, CSc., doc. Mgr. Pavol Bokes, PhD., Candan Çelik   |       |   |       |      |      |
| <b>Last change:</b> 20.02.2018   |       |   |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |       |      |      |

## COURSE DESCRIPTION

|   |   |
|---|---|
| <b>University:</b> Comenius University in Bratislava  |   |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |   |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-116/10   | <b>Course title:</b><br>Multivariate Statistical Analyses (2) |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning  |   |
| <b>Number of credits:</b> 5   |   |
| <b>Recommended semester:</b> 2.   |   |
| <b>Educational level:</b> II.   |   |
| <b>Prerequisites:</b>   |   |
| <b>Recommended prerequisites:</b><br>2-PMS-115 Multivariate Statistical Analyses (1)  |   |
| <b>Antirequisites:</b> PriF-FMFI.KAMŠ/N-bBXX-082/15 and FMFI.KAMŠ/2-PMS-116/19  |   |
| <b>Course requirements:</b><br>Preliminary semester evaluation: project<br>Final examination: oral examination<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 50/50   |   |
| <b>Learning outcomes:</b><br>Upon satisfactory completion of the course, students will be able to use selected multivariate statistical methods of dimensionality reduction, data clustering, discrimination and classification.  |   |
| <b>Class syllabus:</b><br>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. |   |
| <b>Recommended literature:</b><br>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: 410

| A     | B     | C     | D    | E    | FX   |
|-------|-------|-------|------|------|------|
| 48,29 | 24,88 | 12,68 | 7,07 | 5,61 | 1,46 |

**Lecturers:** doc. Mgr. Radoslav Harman, PhD.

**Last change:** 11.04.2017

**Approved by:** prof. RNDr. Marek Fila, DrSc.

## COURSE DESCRIPTION

|  |       |   |       |      |     |
|--|-------|---|-------|------|-----|
| <b>University:</b> Comenius University in Bratislava   |       |   |       |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |       |      |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-115/10  |       | <b>Course title:</b><br>Multivariate Statistical Analysis |       |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning   |       |   |       |      |     |
| <b>Number of credits:</b> 5  |       |   |       |      |     |
| <b>Recommended semester:</b> 1.  |       |   |       |      |     |
| <b>Educational level:</b> II.  |       |   |       |      |     |
| <b>Prerequisites:</b>  |       |   |       |      |     |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 50/50  |       |   |       |      |     |
| <b>Learning outcomes:</b>  |       |   |       |      |     |
| <b>Class syllabus:</b><br>Multivariate distributions: multivariate normal distribution, Wishart distribution, Hotelling's distribution, Wilk' distribution. Multivariate linear models. Multivariate regression model. Multivariate analysis of variance, the case of one factor, the case of two factors. Analysis of covariance. Qualitative and quantitative factors.                                 |       |   |       |      |     |
| <b>Recommended literature:</b><br>Wolfgang Karl Härdle, Léopold Simar. Heidelberg: Applied multivariate statistical analysis, Springer, 2012<br>Wolfgang Härdle, Zdeněk Hlávka: Multivariate statistics: Exercises and solutions. New York: Springer, 2007<br>František Lamoš, Rastislav Potocký: Pravdepodobnosť a matematická štatistika: Štatistické analýzy. Bratislava: Univerzita Komenského, 1998 |       |   |       |      |     |
| <b>Languages necessary to complete the course:</b>   |       |   |       |      |     |
| <b>Notes:</b>  |       |   |       |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 312  |       |   |       |      |     |
| A  | B     | C   | D     | E    | FX  |
| 34,94  | 22,44 | 22,12   | 13,14 | 5,77 | 1,6 |
| <b>Lecturers:</b> Mgr. Lenka Filová, PhD.  |       |   |       |      |     |
| <b>Last change:</b> 18.06.2015   |       |   |       |      |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |       |      |     |

## COURSE DESCRIPTION

|   |       |  |      |      |      |
|---|-------|--|------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |      |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-212/15   |       | <b>Course title:</b><br>Nonparametric Statistics |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning |       |  |      |      |      |
| <b>Number of credits:</b> 3   |       |  |      |      |      |
| <b>Recommended semester:</b> 4.   |       |  |      |      |      |
| <b>Educational level:</b> II.   |       |  |      |      |      |
| <b>Prerequisites:</b>   |       |  |      |      |      |
| <b>Course requirements:</b>   |       |  |      |      |      |
| <b>Learning outcomes:</b>   |       |  |      |      |      |
| <b>Class syllabus:</b>  |       |  |      |      |      |
| <b>Recommended literature:</b>  |       |  |      |      |      |
| <b>Languages necessary to complete the course:</b>  |       |  |      |      |      |
| <b>Notes:</b>   |       |  |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 114   |       |  |      |      |      |
| A   | B     | C  | D    | E    | FX   |
| 62,28   | 12,28 | 8,77   | 7,02 | 6,14 | 3,51 |
| <b>Lecturers:</b> Mgr. Ján Somorčík, PhD.   |       |  |      |      |      |
| <b>Last change:</b> 12.10.2016  |       |  |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |  |      |      |      |

## COURSE DESCRIPTION

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|---|-----|--|-----|-------|-----|
| <b>University:</b> Comenius University in Bratislava  |     |  |     |       |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |     |  |     |       |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-135/00   |     | <b>Course title:</b><br>Pensions and Pension Funds |     |       |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |     |  |     |       |     |
| <b>Number of credits:</b> 3   |     |  |     |       |     |
| <b>Recommended semester:</b> 2., 4.   |     |  |     |       |     |
| <b>Educational level:</b> II.   |     |  |     |       |     |
| <b>Prerequisites:</b>   |     |  |     |       |     |
| <b>Course requirements:</b>   |     |  |     |       |     |
| <b>Learning outcomes:</b>   |     |  |     |       |     |
| <b>Class syllabus:</b><br>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. |     |  |     |       |     |
| <b>Recommended literature:</b><br>Škrovánková L.: Penzijné a zdravotné poistenie, Ekonóm 1999<br>Škrovánková L., Bilíková M.: Penzijné a nemocenské poistenie, Ekonóm 2002<br>Lee E. M.: An Inroduction to Pension Schemes, Institute of Actuaries and Faculty of Actuaries 1986  |     |  |     |       |     |
| <b>Languages necessary to complete the course:</b>  |     |  |     |       |     |
| <b>Notes:</b>   |     |  |     |       |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 6   |     |  |     |       |     |
| A   | B   | C  | D   | E     | FX  |
| 50,0  | 0,0 | 16,67  | 0,0 | 33,33 | 0,0 |
| <b>Lecturers:</b> Mgr. Gábor Szűcs, PhD.  |     |  |     |       |     |
| <b>Last change:</b> 21.04.2017  |     |  |     |       |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |     |  |     |       |     |

## COURSE DESCRIPTION

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|--|------|--|-----|-----|------|
| <b>University:</b> Comenius University in Bratislava   |      |  |     |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |  |     |     |      |
| <b>Course ID:</b><br>FMFI.KTV/2-MXX-110/00   |      | <b>Course title:</b><br>Physical Education and Sport (1) |     |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |      |  |     |     |      |
| <b>Number of credits:</b> 2  |      |  |     |     |      |
| <b>Recommended semester:</b> 1.  |      |  |     |     |      |
| <b>Educational level:</b> II.  |      |  |     |     |      |
| <b>Prerequisites:</b>  |      |  |     |     |      |
| <b>Course requirements:</b>  |      |  |     |     |      |
| <b>Learning outcomes:</b>  |      |  |     |     |      |
| <b>Class syllabus:</b><br>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. |      |  |     |     |      |
| <b>Recommended literature:</b>   |      |  |     |     |      |
| <b>Languages necessary to complete the course:</b>   |      |  |     |     |      |
| <b>Notes:</b>  |      |  |     |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1433   |      |  |     |     |      |
| A  | B    | C  | D   | E   | FX   |
| 99,16  | 0,56 | 0,0  | 0,0 | 0,0 | 0,28 |
| <b>Lecturers:</b> 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  |      |  |     |     |      |
| <b>Last change:</b> 02.06.2015   |      |  |     |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |  |     |     |      |

## COURSE DESCRIPTION

|  |      |  |      |     |      |
|--|------|--|------|-----|------|
| <b>University:</b> Comenius University in Bratislava   |      |  |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |  |      |     |      |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-120/00   |      | <b>Course title:</b><br>Physical Education and Sport (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |      |  |      |     |      |
| <b>Number of credits:</b> 2  |      |  |      |     |      |
| <b>Recommended semester:</b> 2.  |      |  |      |     |      |
| <b>Educational level:</b> II.  |      |  |      |     |      |
| <b>Prerequisites:</b>  |      |  |      |     |      |
| <b>Course requirements:</b>  |      |  |      |     |      |
| <b>Learning outcomes:</b>  |      |  |      |     |      |
| <b>Class syllabus:</b><br>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. |      |  |      |     |      |
| <b>Recommended literature:</b>   |      |  |      |     |      |
| <b>Languages necessary to complete the course:</b>   |      |  |      |     |      |
| <b>Notes:</b>  |      |  |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1331   |      |  |      |     |      |
| A  | B    | C  | D    | E   | FX   |
| 99,77  | 0,08 | 0,0  | 0,08 | 0,0 | 0,08 |
| <b>Lecturers:</b> 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.  |      |  |      |     |      |
| <b>Last change:</b> 02.06.2015   |      |  |      |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |  |      |     |      |

## COURSE DESCRIPTION

|  |      |  |     |     |      |
|--|------|--|-----|-----|------|
| <b>University:</b> Comenius University in Bratislava   |      |  |     |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |  |     |     |      |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-210/00   |      | <b>Course title:</b><br>Physical Education and Sport (3) |     |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |      |  |     |     |      |
| <b>Number of credits:</b> 2  |      |  |     |     |      |
| <b>Recommended semester:</b> 3.  |      |  |     |     |      |
| <b>Educational level:</b> II.  |      |  |     |     |      |
| <b>Prerequisites:</b>  |      |  |     |     |      |
| <b>Course requirements:</b>  |      |  |     |     |      |
| <b>Learning outcomes:</b>  |      |  |     |     |      |
| <b>Class syllabus:</b><br>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. |      |  |     |     |      |
| <b>Recommended literature:</b>   |      |  |     |     |      |
| <b>Languages necessary to complete the course:</b>   |      |  |     |     |      |
| <b>Notes:</b>  |      |  |     |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1081   |      |  |     |     |      |
| A  | B    | C  | D   | E   | FX   |
| 99,44  | 0,37 | 0,0  | 0,0 | 0,0 | 0,19 |
| <b>Lecturers:</b> 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  |      |  |     |     |      |
| <b>Last change:</b> 02.06.2015   |      |  |     |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |  |     |     |      |

## COURSE DESCRIPTION

|  |      |  |     |     |     |
|--|------|--|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |      |  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |  |     |     |     |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-220/00   |      | <b>Course title:</b><br>Physical Education and Sport (4) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |      |  |     |     |     |
| <b>Number of credits:</b> 2  |      |  |     |     |     |
| <b>Recommended semester:</b> 4.  |      |  |     |     |     |
| <b>Educational level:</b> II.  |      |  |     |     |     |
| <b>Prerequisites:</b>  |      |  |     |     |     |
| <b>Course requirements:</b>  |      |  |     |     |     |
| <b>Learning outcomes:</b>  |      |  |     |     |     |
| <b>Class syllabus:</b><br>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. |      |  |     |     |     |
| <b>Recommended literature:</b>   |      |  |     |     |     |
| <b>Languages necessary to complete the course:</b>   |      |  |     |     |     |
| <b>Notes:</b>  |      |  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 957  |      |  |     |     |     |
| A  | B    | C  | D   | E   | FX  |
| 99,37  | 0,42 | 0,0  | 0,0 | 0,1 | 0,1 |
| <b>Lecturers:</b> 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.  |      |  |     |     |     |
| <b>Last change:</b> 02.06.2015   |      |  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |  |     |     |     |



## COURSE DESCRIPTION

|  |       |   |      |      |      |
|--|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-EFM-152/15  |       | <b>Course title:</b><br>Principles of Mathematical Modelling in Science and Engineering |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |   |      |      |      |
| <b>Number of credits:</b> 3  |       |   |      |      |      |
| <b>Recommended semester:</b> 1.  |       |   |      |      |      |
| <b>Educational level:</b> II.  |       |   |      |      |      |
| <b>Prerequisites:</b>  |       |   |      |      |      |
| <b>Course requirements:</b>  |       |   |      |      |      |
| <b>Learning outcomes:</b>  |       |   |      |      |      |
| <b>Class syllabus:</b>   |       |   |      |      |      |
| <b>Recommended literature:</b>   |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b>   |       |   |      |      |      |
| <b>Notes:</b>  |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 49   |       |   |      |      |      |
| A  | B     | C   | D    | E    | FX   |
| 51,02  | 22,45 | 8,16  | 8,16 | 2,04 | 8,16 |
| <b>Lecturers:</b> doc. RNDr. Peter Guba, PhD.  |       |   |      |      |      |
| <b>Last change:</b> 02.06.2015   |       |   |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |   |      |      |      |

## COURSE DESCRIPTION

|  |       |  |       |       |      |
|--|-------|--|-------|-------|------|
| <b>University:</b> Comenius University in Bratislava   |       |  |       |       |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |  |       |       |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-141/15  |       | <b>Course title:</b><br>Probability Theory |       |       |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning |       |  |       |       |      |
| <b>Number of credits:</b> 5  |       |  |       |       |      |
| <b>Recommended semester:</b> 1.  |       |  |       |       |      |
| <b>Educational level:</b> II.  |       |  |       |       |      |
| <b>Prerequisites:</b>  |       |  |       |       |      |
| <b>Course requirements:</b>  |       |  |       |       |      |
| <b>Learning outcomes:</b>  |       |  |       |       |      |
| <b>Class syllabus:</b>   |       |  |       |       |      |
| <b>Recommended literature:</b>   |       |  |       |       |      |
| <b>Languages necessary to complete the course:</b>   |       |  |       |       |      |
| <b>Notes:</b>  |       |  |       |       |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 65   |       |  |       |       |      |
| A  | B     | C  | D     | E     | FX   |
| 21,54  | 16,92 | 23,08                                      | 24,62 | 12,31 | 1,54 |
| <b>Lecturers:</b> Mgr. Ján Somorčík, PhD.  |       |  |       |       |      |
| <b>Last change:</b> 12.10.2016   |       |  |       |       |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |  |       |       |      |

## STATE EXAM DESCRIPTION

|   |   |
|---|---|
| <b>University:</b> Comenius University in Bratislava            |   |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |   |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-952/15                     | <b>Course title:</b><br>Probability and Mathematical Statistics |
| <b>Number of credits:</b> 6                                     |   |
| <b>Educational level:</b> II.                                   |   |
| <b>State exam syllabus:</b>                                     |   |
| <b>Last change:</b> 29.11.2018                                  |   |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.               |   |

## COURSE DESCRIPTION

|   |       |  |     |      |      |
|---|-------|--|-----|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |     |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |     |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-222/15   |       | <b>Course title:</b><br>Programming in SAS |     |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> course<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |  |     |      |      |
| <b>Number of credits:</b> 3   |       |  |     |      |      |
| <b>Recommended semester:</b> 1., 3.   |       |  |     |      |      |
| <b>Educational level:</b> II.   |       |  |     |      |      |
| <b>Prerequisites:</b>   |       |  |     |      |      |
| <b>Course requirements:</b><br>Grading scale: A 90%, B 80%, C 70%, D 60%, E 50%   |       |  |     |      |      |
| <b>Learning outcomes:</b><br>Students will acquire basic knowledge of accessing the databases of various formats via SAS software.  |       |  |     |      |      |
| <b>Class syllabus:</b><br>- orientation in the SAS environment<br>1) DATA step:<br>- reading the data files of various formats<br>- validation and data cleansing<br>- data filtering and creation of derived variables<br>- joining multiple data files<br>- creation of reports<br>- saving outputs<br>2) PROC step:<br>- chosen basic procedures: syntax, basic settings (options) |       |  |     |      |      |
| <b>Recommended literature:</b><br>SAS Institute Inc. 2001. Step-by-Step Programming with Base SAS® Software. Cary, NC: SAS Institute Inc.<br><a href="https://support.sas.com/documentation/onlinedoc/91pdf/sasdoc_913/base_step_10071.pdf">https://support.sas.com/documentation/onlinedoc/91pdf/sasdoc_913/base_step_10071.pdf</a>  |       |  |     |      |      |
| <b>Languages necessary to complete the course:</b><br>slovak, english   |       |  |     |      |      |
| <b>Notes:</b>   |       |  |     |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 90  |       |  |     |      |      |
| A   | B     | C  | D   | E    | FX   |
| 61,11   | 25,56 | 10,0                                       | 0,0 | 2,22 | 1,11 |

|   |
|---|
| <b>Lecturers:</b> doc. Mgr. Ján Mačutek, PhD., Mgr. Jozef Kováč |
| <b>Last change:</b> 05.04.2017                                  |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.               |

## COURSE DESCRIPTION

|   |       |  |       |      |      |
|---|-------|--|-------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |       |      |      |
| <b>Course ID:</b><br>FMFL.KAMŠ/2-PMS-101/00   |       | <b>Course title:</b><br>Random Processes (1) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning |       |  |       |      |      |
| <b>Number of credits:</b> 3   |       |  |       |      |      |
| <b>Recommended semester:</b> 1.   |       |  |       |      |      |
| <b>Educational level:</b> II.   |       |  |       |      |      |
| <b>Prerequisites:</b>   |       |  |       |      |      |
| <b>Course requirements:</b>   |       |  |       |      |      |
| <b>Learning outcomes:</b>   |       |  |       |      |      |
| <b>Class syllabus:</b><br>Random process probability distribution, main characteristics, spectral theory of random processes, basic time series models.                                     |       |  |       |      |      |
| <b>Recommended literature:</b><br>Anděl: Statistická analýzy časových řad.<br>Štulajter: Random Processes and Time Series.  |       |  |       |      |      |
| <b>Languages necessary to complete the course:</b>  |       |  |       |      |      |
| <b>Notes:</b>   |       |  |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 170   |       |  |       |      |      |
| A   | B     | C  | D     | E    | FX   |
| 35,29   | 25,88 | 22,35  | 10,59 | 5,29 | 0,59 |
| <b>Lecturers:</b> doc. Mgr. Ján Mačutek, PhD.   |       |  |       |      |      |
| <b>Last change:</b> 02.06.2015  |       |  |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |  |       |      |      |

## COURSE DESCRIPTION

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|--|------|--|-------|------|------|
| <b>University:</b> Comenius University in Bratislava   |      |  |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |  |       |      |      |
| <b>Course ID:</b><br>FMFL.KAMŠ/2-PMS-102/00  |      | <b>Course title:</b><br>Random Processes (2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |      |  |       |      |      |
| <b>Number of credits:</b> 3  |      |  |       |      |      |
| <b>Recommended semester:</b> 2.  |      |  |       |      |      |
| <b>Educational level:</b> II.  |      |  |       |      |      |
| <b>Prerequisites:</b>  |      |  |       |      |      |
| <b>Course requirements:</b>  |      |  |       |      |      |
| <b>Learning outcomes:</b>  |      |  |       |      |      |
| <b>Class syllabus:</b><br>Mean values estimation, estimation of covariance function, periodogram, estimation of time series models parameters.   |      |  |       |      |      |
| <b>Recommended literature:</b><br>Anděl: Statistická analýzy časových řad.<br>Štulajter: Random Processes and Time Series.   |      |  |       |      |      |
| <b>Languages necessary to complete the course:</b>   |      |  |       |      |      |
| <b>Notes:</b>  |      |  |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 173  |      |  |       |      |      |
| A  | B    | C  | D     | E    | FX   |
| 34,68  | 23,7 | 19,65  | 13,87 | 6,36 | 1,73 |
| <b>Lecturers:</b> doc. Mgr. Ján Mačutek, PhD.  |      |  |       |      |      |
| <b>Last change:</b> 02.06.2015   |      |  |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |  |       |      |      |

## COURSE DESCRIPTION

|  |       |   |       |      |      |
|--|-------|---|-------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |   |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |   |       |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-107/15  |       | <b>Course title:</b><br>Regression Models |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning   |       |   |       |      |      |
| <b>Number of credits:</b> 5  |       |   |       |      |      |
| <b>Recommended semester:</b> 1.  |       |   |       |      |      |
| <b>Educational level:</b> II.  |       |   |       |      |      |
| <b>Prerequisites:</b>  |       |   |       |      |      |
| <b>Course requirements:</b>  |       |   |       |      |      |
| <b>Learning outcomes:</b><br>Students will understand to the theory and methods of linear and nonlinear regression experiments, they will be able to apply the knowledge in sciences, industry and medicine.   |       |   |       |      |      |
| <b>Class syllabus:</b><br>Some properties of matrices. Linear model: the Gauss-Markov theorem, confidence ellipsoids, confidence bounds, testing submodels. Nonlinear regression models: geometrical interpretation, linearization of models, iterative methods of computation of least squares estimates, the consistency and asymptotic normality of estimates.  |       |   |       |      |      |
| <b>Recommended literature:</b><br>Prednášky z regresných modelov : Odhadovanie parametrov strednej hodnoty a štatistická optimalizácia experimentu / Andej Pázman, Vladimír Lacko. Bratislava : Univerzita Komenského, 2012<br>Matematická statistika / Jiří Anděl. Praha : Státní nakladatelství technické literatury, 1985<br>Nonlinear statistical models / Andrej Pázman. Bratislava Dodrecht : Ister Science Press : Kluwer Academic Publishers, 1993 |       |   |       |      |      |
| <b>Languages necessary to complete the course:</b>   |       |   |       |      |      |
| <b>Notes:</b>  |       |   |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 64   |       |   |       |      |      |
| A  | B     | C   | D     | E    | FX   |
| 20,31  | 17,19 | 26,56                                     | 21,88 | 12,5 | 1,56 |
| <b>Lecturers:</b> doc. Mgr. Radoslav Harman, PhD., Mgr. Lenka Filová, PhD.   |       |   |       |      |      |
| <b>Last change:</b> 02.05.2017   |       |   |       |      |      |



**Approved by:** prof. RNDr. Marek Fila, DrSc.

## COURSE DESCRIPTION

|   |       |   |       |       |      |
|---|-------|---|-------|-------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |       |       |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |       |       |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-108/15   |       | <b>Course title:</b><br>Regression Models (2) |       |       |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 2 <b>per level/semester:</b> 28 / 28<br><b>Form of the course:</b> on-site learning  |       |   |       |       |      |
| <b>Number of credits:</b> 5   |       |   |       |       |      |
| <b>Recommended semester:</b> 2.   |       |   |       |       |      |
| <b>Educational level:</b> II.   |       |   |       |       |      |
| <b>Prerequisites:</b> FMFI.KAMŠ/2-PMS-107/15 - Regression Models  |       |   |       |       |      |
| <b>Antirequisites:</b> FMFI.KAMŠ/2-PMS-108/00   |       |   |       |       |      |
| <b>Course requirements:</b><br>Preliminary semester evaluation: written exam<br>Final examination: oral exam<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 40/60   |       |   |       |       |      |
| <b>Learning outcomes:</b><br>The students will be able to use mathematical tools for comparing experiments from the information point of view; computational methods for optimal experimental design. They will also be able to apply these methods in biomedical and technical fields.   |       |   |       |       |      |
| <b>Class syllabus:</b><br>Criteria of optimality in linear regression experiment, Elfving set, properties of convex functions, analytical properties of optimality criteria, equivalence theorem, iterative methods of computing optimal designs, using asymptotic properties for optimization of the experiment in nonlinear models, exact experimental design |       |   |       |       |      |
| <b>Recommended literature:</b><br>Prednášky z regresných modelov : Odhadovanie parametrov strednej hodnoty a štatistická optimalizácia experimentu / Andej Pázman, Vladimír Lacko. Bratislava : Univerzita Komenského, 2012   |       |   |       |       |      |
| <b>Languages necessary to complete the course:</b><br>Slovak, English   |       |   |       |       |      |
| <b>Notes:</b>   |       |   |       |       |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 171   |       |   |       |       |      |
| A   | B     | C   | D     | E     | FX   |
| 29,24   | 25,15 | 15,79   | 18,71 | 10,53 | 0,58 |
| <b>Lecturers:</b> doc. Mgr. Radoslav Harman, PhD., Mgr. Lenka Filová, PhD.  |       |   |       |       |      |

|   |
|---|
| <b>Last change:</b> 08.05.2017                    |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc. |

## COURSE DESCRIPTION

|  |     |   |      |     |     |
|--|-----|---|------|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |     |   |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |     |   |      |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-220/13  |     | <b>Course title:</b><br>Regression Models with Random Effects |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |   |      |     |     |
| <b>Number of credits:</b> 3  |     |   |      |     |     |
| <b>Recommended semester:</b> 2., 4.  |     |   |      |     |     |
| <b>Educational level:</b> II.  |     |   |      |     |     |
| <b>Prerequisites:</b> FMFI.KAMŠ/2-PMS-107/15 - Regression Models   |     |   |      |     |     |
| <b>Course requirements:</b>  |     |   |      |     |     |
| <b>Learning outcomes:</b>  |     |   |      |     |     |
| <b>Class syllabus:</b>   |     |   |      |     |     |
| <b>Recommended literature:</b>   |     |   |      |     |     |
| <b>Languages necessary to complete the course:</b>   |     |   |      |     |     |
| <b>Notes:</b>  |     |   |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 5  |     |   |      |     |     |
| A  | B   | C   | D    | E   | FX  |
| 80,0   | 0,0 | 0,0   | 20,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Viktor Witkovský, CSc.  |     |   |      |     |     |
| <b>Last change:</b> 02.06.2015   |     |   |      |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |     |   |      |     |     |

## COURSE DESCRIPTION

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|--|-------|--|------|------|-----|
| <b>University:</b> Comenius University in Bratislava   |       |  |      |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |  |      |      |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-218/13  |       | <b>Course title:</b><br>Reliability Theory |      |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |  |      |      |     |
| <b>Number of credits:</b> 3  |       |  |      |      |     |
| <b>Recommended semester:</b> 1.  |       |  |      |      |     |
| <b>Educational level:</b> II.  |       |  |      |      |     |
| <b>Prerequisites:</b>  |       |  |      |      |     |
| <b>Course requirements:</b>  |       |  |      |      |     |
| <b>Learning outcomes:</b>  |       |  |      |      |     |
| <b>Class syllabus:</b>   |       |  |      |      |     |
| <b>Recommended literature:</b>   |       |  |      |      |     |
| <b>Languages necessary to complete the course:</b>   |       |  |      |      |     |
| <b>Notes:</b>  |       |  |      |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 38   |       |  |      |      |     |
| A  | B     | C  | D    | E    | FX  |
| 60,53  | 18,42 | 13,16                                      | 2,63 | 5,26 | 0,0 |
| <b>Lecturers:</b> doc. Mgr. Ján Mačutek, PhD.  |       |  |      |      |     |
| <b>Last change:</b> 02.06.2015   |       |  |      |      |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |  |      |      |     |

## COURSE DESCRIPTION

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|---|------|--|------|------|------|
| <b>University:</b> Comenius University in Bratislava  |      |  |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |      |  |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-161/00  |      | <b>Course title:</b><br>Russian Language (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |      |  |      |      |      |
| <b>Number of credits:</b> 2   |      |  |      |      |      |
| <b>Recommended semester:</b> 1.   |      |  |      |      |      |
| <b>Educational level:</b> I., II.   |      |  |      |      |      |
| <b>Prerequisites:</b>   |      |  |      |      |      |
| <b>Course requirements:</b>   |      |  |      |      |      |
| <b>Learning outcomes:</b>   |      |  |      |      |      |
| <b>Class syllabus:</b><br>The subject provides a course in Russian language for beginners.  |      |  |      |      |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.   |      |  |      |      |      |
| <b>Languages necessary to complete the course:</b>  |      |  |      |      |      |
| <b>Notes:</b>   |      |  |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 654   |      |  |      |      |      |
| A   | B    | C  | D    | E    | FX   |
| 60,4  | 15,9 | 10,09  | 4,74 | 1,83 | 7,03 |
| <b>Lecturers:</b> PhDr. Elena Klátiková   |      |  |      |      |      |
| <b>Last change:</b> 02.06.2015  |      |  |      |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |      |  |      |      |      |

## COURSE DESCRIPTION

|   |       |  |      |     |      |
|---|-------|--|------|-----|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |      |     |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-162/00  |       | <b>Course title:</b><br>Russian Language (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |  |      |     |      |
| <b>Number of credits:</b> 2   |       |  |      |     |      |
| <b>Recommended semester:</b> 2.   |       |  |      |     |      |
| <b>Educational level:</b> I., II.   |       |  |      |     |      |
| <b>Prerequisites:</b>   |       |  |      |     |      |
| <b>Course requirements:</b>   |       |  |      |     |      |
| <b>Learning outcomes:</b>   |       |  |      |     |      |
| <b>Class syllabus:</b><br>The subject continues the program of Russian language (1) and provides a course of Russian for beginners.   |       |  |      |     |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.   |       |  |      |     |      |
| <b>Languages necessary to complete the course:</b>  |       |  |      |     |      |
| <b>Notes:</b>   |       |  |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 399   |       |  |      |     |      |
| A   | B     | C  | D    | E   | FX   |
| 65,66   | 15,79 | 9,02   | 4,01 | 1,0 | 4,51 |
| <b>Lecturers:</b> PhDr. Elena Klátiková   |       |  |      |     |      |
| <b>Last change:</b> 02.06.2015  |       |  |      |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |  |      |     |      |

## COURSE DESCRIPTION

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|---|-------|--|------|-----|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |      |     |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-261/00  |       | <b>Course title:</b><br>Russian Language (3) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning         |       |  |      |     |      |
| <b>Number of credits:</b> 2   |       |  |      |     |      |
| <b>Recommended semester:</b> 3.   |       |  |      |     |      |
| <b>Educational level:</b> I., II.   |       |  |      |     |      |
| <b>Prerequisites:</b>   |       |  |      |     |      |
| <b>Course requirements:</b>   |       |  |      |     |      |
| <b>Learning outcomes:</b>   |       |  |      |     |      |
| <b>Class syllabus:</b><br>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. |       |  |      |     |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.   |       |  |      |     |      |
| <b>Languages necessary to complete the course:</b>  |       |  |      |     |      |
| <b>Notes:</b>   |       |  |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 196   |       |  |      |     |      |
| A   | B     | C  | D    | E   | FX   |
| 70,41   | 17,35 | 8,67   | 2,55 | 0,0 | 1,02 |
| <b>Lecturers:</b> PhDr. Elena Klátiková   |       |  |      |     |      |
| <b>Last change:</b> 02.06.2015  |       |  |      |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |  |      |     |      |



## COURSE DESCRIPTION

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|---|-------|--|-----|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |  |     |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |  |     |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-262/00  |       | <b>Course title:</b><br>Russian Language (4) |     |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning         |       |  |     |      |      |
| <b>Number of credits:</b> 2   |       |  |     |      |      |
| <b>Recommended semester:</b> 4.   |       |  |     |      |      |
| <b>Educational level:</b> I., II.   |       |  |     |      |      |
| <b>Prerequisites:</b>   |       |  |     |      |      |
| <b>Course requirements:</b>   |       |  |     |      |      |
| <b>Learning outcomes:</b>   |       |  |     |      |      |
| <b>Class syllabus:</b><br>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. |       |  |     |      |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.   |       |  |     |      |      |
| <b>Languages necessary to complete the course:</b>  |       |  |     |      |      |
| <b>Notes:</b>   |       |  |     |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 138   |       |  |     |      |      |
| A   | B     | C  | D   | E    | FX   |
| 75,36   | 13,04 | 7,25   | 2,9 | 0,72 | 0,72 |
| <b>Lecturers:</b> PhDr. Elena Klátiková   |       |  |     |      |      |
| <b>Last change:</b> 02.06.2015  |       |  |     |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |  |     |      |      |

## COURSE DESCRIPTION

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|--|-------|---------------------------------------|-------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |                                       |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |                                       |       |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-EFM-140/15  |       | <b>Course title:</b><br>SQL Databases |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |                                       |       |      |      |
| <b>Number of credits:</b> 3  |       |                                       |       |      |      |
| <b>Recommended semester:</b> 3.  |       |                                       |       |      |      |
| <b>Educational level:</b> II.  |       |                                       |       |      |      |
| <b>Prerequisites:</b>  |       |                                       |       |      |      |
| <b>Antirequisites:</b> FMFI.KAMŠ/2-EFM-140/10  |       |                                       |       |      |      |
| <b>Course requirements:</b>  |       |                                       |       |      |      |
| <b>Learning outcomes:</b>  |       |                                       |       |      |      |
| <b>Class syllabus:</b>   |       |                                       |       |      |      |
| <b>Recommended literature:</b>   |       |                                       |       |      |      |
| <b>Languages necessary to complete the course:</b>   |       |                                       |       |      |      |
| <b>Notes:</b>  |       |                                       |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 263  |       |                                       |       |      |      |
| A  | B     | C                                     | D     | E    | FX   |
| 44,11  | 18,25 | 19,01                                 | 10,65 | 7,22 | 0,76 |
| <b>Lecturers:</b> Ing. Alexander Šimko, PhD.   |       |                                       |       |      |      |
| <b>Last change:</b> 02.06.2015   |       |                                       |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |                                       |       |      |      |

## COURSE DESCRIPTION

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|--|---|
| <b>University:</b> Comenius University in Bratislava   |   |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |   |
| <b>Course ID:</b><br>FMFL.KAMŠ/2-EFM-143/17  | <b>Course title:</b><br>Selected Actuarial Techniques |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |   |
| <b>Number of credits:</b> 2  |   |
| <b>Recommended semester:</b> 2., 4.  |   |
| <b>Educational level:</b> II.  |   |
| <b>Prerequisites:</b>  |   |
| <b>Course requirements:</b><br>Preliminary assessment: individual work, individual assignments, project.<br>Approximate final assessment: A 90%, B 80%, C 70%, D 60%, E 50%.<br>Scale of assessment (preliminary/final): 100/0   |   |
| <b>Learning outcomes:</b><br>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.   |   |
| <b>Class syllabus:</b><br>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.<br>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.<br>Portfolio management in the insurance company using actuarial and financial indicators and relationships between them. |   |
| <b>Recommended literature:</b><br>Zurich Insurance Company Ltd internal training materials   |   |
| <b>Languages necessary to complete the course:</b><br>Slovak, English  |   |
| <b>Notes:</b><br>Limit: maximum 25 students.<br>It is recommended to attend Exercises from Insurance Theory or any similar subject.  |   |

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|--|-------|-------|-----|-----|------|
| <b>Past grade distribution</b>   |       |       |     |     |      |
| Total number of evaluated students: 14   |       |       |     |     |      |
| A  | B     | C     | D   | E   | FX   |
| 21,43  | 42,86 | 28,57 | 0,0 | 0,0 | 7,14 |
| <b>Lecturers:</b> Mgr. Peter Cvacho, Mgr. Lukáš Kurinec, Mgr. Matej Breja, Ing. Pavel Gašpar, PhD. |       |       |     |     |      |
| <b>Last change:</b> 24.08.2017   |       |       |     |     |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |       |     |     |      |

## COURSE DESCRIPTION

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|--|------|--|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |      |  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |      |  |     |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-125/00  |      | <b>Course title:</b><br>Seminar in Mathematical Statistics (1) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                             |      |  |     |     |     |
| <b>Number of credits:</b> 3  |      |  |     |     |     |
| <b>Recommended semester:</b> 3.  |      |  |     |     |     |
| <b>Educational level:</b> II.  |      |  |     |     |     |
| <b>Prerequisites:</b>  |      |  |     |     |     |
| <b>Course requirements:</b><br>Preliminary semester evaluation: talks<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 100/0                                     |      |  |     |     |     |
| <b>Learning outcomes:</b><br>The students will extend their knowledge in selected areas related to the statistical topics included in the master study program. Moreover, the students will improve their presentation skills. |      |  |     |     |     |
| <b>Class syllabus:</b><br>Talks on the topics extending the statistical methods included in the master study program, and the topics of students' diploma theses.  |      |  |     |     |     |
| <b>Recommended literature:</b><br>Anděl, J.: Statistické metody, Matfyzpress Praha 1998<br>Literature given in the information sheets of the obligatory courses of the study program   |      |  |     |     |     |
| <b>Languages necessary to complete the course:</b><br>Slovak, English  |      |  |     |     |     |
| <b>Notes:</b>  |      |  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 151  |      |  |     |     |     |
| A  | B    | C  | D   | E   | FX  |
| 91,39  | 6,62 | 1,99   | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. Mgr. Radoslav Harman, PhD.  |      |  |     |     |     |
| <b>Last change:</b> 08.05.2017   |      |  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |      |  |     |     |     |

## COURSE DESCRIPTION

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|---|-----|--|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava  |     |  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |     |  |     |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-126/00   |     | <b>Course title:</b><br>Seminar in Mathematical Statistics (2) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning        |     |  |     |     |     |
| <b>Number of credits:</b> 3   |     |  |     |     |     |
| <b>Recommended semester:</b> 4.   |     |  |     |     |     |
| <b>Educational level:</b> II.   |     |  |     |     |     |
| <b>Prerequisites:</b>   |     |  |     |     |     |
| <b>Course requirements:</b><br>Preliminary assessment: individual assessment of student's presentations<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%                                |     |  |     |     |     |
| <b>Learning outcomes:</b><br>The student will enlarge his knowledge in a selected field concerning problems of probability or random processes. He will gain an experience with individual presentations. |     |  |     |     |     |
| <b>Class syllabus:</b><br>Presentations of themes by students according to selected topics in probability and random processes.   |     |  |     |     |     |
| <b>Recommended literature:</b><br>Basic literature given in the information sheets of the obligatory subjects of the study program.   |     |  |     |     |     |
| <b>Languages necessary to complete the course:</b>  |     |  |     |     |     |
| <b>Notes:</b>   |     |  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 151   |     |  |     |     |     |
| A   | B   | C  | D   | E   | FX  |
| 98,68   | 0,0 | 1,32   | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Katarína Janková, CSc.   |     |  |     |     |     |
| <b>Last change:</b> 02.05.2017  |     |  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |     |  |     |     |     |

## COURSE DESCRIPTION

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|--|-------|--|-------|------|------|
| <b>University:</b> Comenius University in Bratislava   |       |  |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |       |  |       |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-121/00  |       | <b>Course title:</b><br>Sequential Methods |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |       |  |       |      |      |
| <b>Number of credits:</b> 3  |       |  |       |      |      |
| <b>Recommended semester:</b> 4.  |       |  |       |      |      |
| <b>Educational level:</b> II.  |       |  |       |      |      |
| <b>Prerequisites:</b>  |       |  |       |      |      |
| <b>Course requirements:</b><br>Preliminary semester evaluation: test and homeworks<br>Final examination: written examination<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%  |       |  |       |      |      |
| <b>Learning outcomes:</b><br>Upon satisfactory completion of the course the student will be able to use sequential procedures for the statistical hypothesis testing and the estimation of unknown parameters.   |       |  |       |      |      |
| <b>Class syllabus:</b><br>Sequential hypothesis testing, sequential tests for quality control. Wald sequential test, its properties and characteristics. Wald's identities and their applications for operation characteristics and average sample number of a sequential test. Testing composite hypotheses, Sobel Wald test, comparison of parameters of two distributions. Sequential point estimation, Rao-Cramer theorem, Stein's two stage procedure. Sequential confidence intervals. |       |  |       |      |      |
| <b>Recommended literature:</b><br>Hušková: Sekvenční analýza.<br>Rao: Lineární metody statistické indukce a jejich aplikace.<br>Govindarajulu, Z: Sequential statistics (2004)   |       |  |       |      |      |
| <b>Languages necessary to complete the course:</b>   |       |  |       |      |      |
| <b>Notes:</b>  |       |  |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 153  |       |  |       |      |      |
| A  | B     | C  | D     | E    | FX   |
| 33,99  | 26,14 | 19,61                                      | 15,03 | 3,92 | 1,31 |
| <b>Lecturers:</b> doc. RNDr. Katarína Janková, CSc.  |       |  |       |      |      |
| <b>Last change:</b> 24.04.2017   |       |  |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |       |  |       |      |      |

## COURSE DESCRIPTION

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|---|-------|---|-----|------|-----|
| <b>University:</b> Comenius University in Bratislava  |       |   |     |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |     |      |     |
| <b>Course ID:</b><br>FMFL.KAMŠ/2-PMS-161/12   |       | <b>Course title:</b><br>Some Aspects of Insurance Legislation |     |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |       |   |     |      |     |
| <b>Number of credits:</b> 3   |       |   |     |      |     |
| <b>Recommended semester:</b> 1.   |       |   |     |      |     |
| <b>Educational level:</b> II.   |       |   |     |      |     |
| <b>Prerequisites:</b>   |       |   |     |      |     |
| <b>Course requirements:</b><br>Preliminary assessment: test during the semester<br>Final assessment: test at the end of the semester<br>Scale of assessment (preliminary/final): 80/20  |       |   |     |      |     |
| <b>Learning outcomes:</b><br>After completing the course, the student will master basics of insurance legislation and the most important laws, decrees and directives affecting the insurance sector. The student should also know details of financial market supervision in Slovakia.   |       |   |     |      |     |
| <b>Class syllabus:</b><br>Current legislation regulating business conditions in the insurance sector. Reporting obligations of the insurance companies. Method of accounting and reporting of premium and claims. Accounting and creation of technical provisions. Solvency and the guarantee fund. Insurance supervision. Reinsurance. |       |   |     |      |     |
| <b>Recommended literature:</b><br>Civil Code (Act No. 40/1964 Coll.)<br>Insurance laws<br>Decrees issued by the National Bank of Slovakia<br>Directive 2009/138/EC of the European Parliament and of the Council on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)                                |       |   |     |      |     |
| <b>Languages necessary to complete the course:</b><br>Slovak, English   |       |   |     |      |     |
| <b>Notes:</b>   |       |   |     |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 37  |       |   |     |      |     |
| A   | B     | C   | D   | E    | FX  |
| 43,24   | 40,54 | 8,11  | 2,7 | 5,41 | 0,0 |
| <b>Lecturers:</b> Mgr. Rastislav Noška, Mgr. Miroslava Mikulová   |       |   |     |      |     |



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| <b>Last change:</b> 07.09.2017                    |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc. |

## COURSE DESCRIPTION

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|--|-----|---|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |     |   |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |     |   |     |     |     |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-115/17   |     | <b>Course title:</b><br>Sports in Natur (1) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b><br><b>Number of hours:</b><br><b>per week: per level/semester:</b><br><b>Form of the course:</b> on-site learning |     |   |     |     |     |
| <b>Number of credits:</b> 2  |     |   |     |     |     |
| <b>Recommended semester:</b> 1.  |     |   |     |     |     |
| <b>Educational level:</b> II.  |     |   |     |     |     |
| <b>Prerequisites:</b>  |     |   |     |     |     |
| <b>Course requirements:</b>  |     |   |     |     |     |
| <b>Learning outcomes:</b>  |     |   |     |     |     |
| <b>Class syllabus:</b>   |     |   |     |     |     |
| <b>Recommended literature:</b>   |     |   |     |     |     |
| <b>Languages necessary to complete the course:</b>   |     |   |     |     |     |
| <b>Notes:</b>  |     |   |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 30   |     |   |     |     |     |
| A  | B   | C   | D   | E   | FX  |
| 100,0  | 0,0 | 0,0   | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Branislav Nedbálek  |     |   |     |     |     |
| <b>Last change:</b>  |     |   |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |     |   |     |     |     |

## COURSE DESCRIPTION

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|--|-----|---|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |     |   |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |     |   |     |     |     |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-116/18   |     | <b>Course title:</b><br>Sports in Natur (2) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b><br><b>Number of hours:</b><br><b>per week: per level/semester:</b><br><b>Form of the course:</b> on-site learning |     |   |     |     |     |
| <b>Number of credits:</b> 2  |     |   |     |     |     |
| <b>Recommended semester:</b> 2.  |     |   |     |     |     |
| <b>Educational level:</b> II.  |     |   |     |     |     |
| <b>Prerequisites:</b>  |     |   |     |     |     |
| <b>Course requirements:</b>  |     |   |     |     |     |
| <b>Learning outcomes:</b>  |     |   |     |     |     |
| <b>Class syllabus:</b>   |     |   |     |     |     |
| <b>Recommended literature:</b>   |     |   |     |     |     |
| <b>Languages necessary to complete the course:</b>   |     |   |     |     |     |
| <b>Notes:</b>  |     |   |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 9  |     |   |     |     |     |
| A  | B   | C   | D   | E   | FX  |
| 100,0  | 0,0 | 0,0   | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Branislav Nedbálek  |     |   |     |     |     |
| <b>Last change:</b>  |     |   |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |     |   |     |     |     |

## COURSE DESCRIPTION

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|--|-----|--|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |     |  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |     |  |     |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-221/14  |     | <b>Course title:</b><br>Statistical methods in clinical trials |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning   |     |  |     |     |     |
| <b>Number of credits:</b> 3  |     |  |     |     |     |
| <b>Recommended semester:</b> 4.  |     |  |     |     |     |
| <b>Educational level:</b> II.  |     |  |     |     |     |
| <b>Prerequisites:</b>  |     |  |     |     |     |
| <b>Recommended prerequisites:</b><br>2-PMS-108 Regression models (2)   |     |  |     |     |     |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 100/0  |     |  |     |     |     |
| <b>Learning outcomes:</b><br>Using statistical methods in the design of clinical trials  |     |  |     |     |     |
| <b>Class syllabus:</b><br>Phases and aims of clinical trials, blinding, randomization, MTD, MED, DLT.<br>Designing clinical trials in Phase I: 3+3 design, group up-and-down designs, continual reassessment method.<br>Designing clinical trials in Phase II: two-stage designs, dose-response designs.<br>Designing clinical trials in Phase III: group sequential methods, adaptive designs, biased-coin rules, designs for estimating MTD and MED.<br>Late-onset toxicity trials |     |  |     |     |     |
| <b>Recommended literature:</b><br>Design of experiments in nonlinear models : Asymptotic normality, optimality criteria and small-sample properties / Luc Pronzato, Andrej Pázman. New York : Springer, 2013   |     |  |     |     |     |
| <b>Languages necessary to complete the course:</b>   |     |  |     |     |     |
| <b>Notes:</b>  |     |  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 18   |     |  |     |     |     |
| A  | B   | C  | D   | E   | FX  |
| 100,0  | 0,0 | 0,0  | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Lenka Filová, PhD.  |     |  |     |     |     |
| <b>Last change:</b> 04.04.2017   |     |  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |     |  |     |     |     |

## COURSE DESCRIPTION

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|---|-------|---|------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |      |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-129/10   |       | <b>Course title:</b><br>Stochastic Optimization Methods |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |       |   |      |      |      |
| <b>Number of credits:</b> 3   |       |   |      |      |      |
| <b>Recommended semester:</b> 3.   |       |   |      |      |      |
| <b>Educational level:</b> II.   |       |   |      |      |      |
| <b>Prerequisites:</b>   |       |   |      |      |      |
| <b>Recommended prerequisites:</b><br>2-PMS-123 Stochastic simulation methods  |       |   |      |      |      |
| <b>Course requirements:</b><br>Evaluation: project, oral exam<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 80/20  |       |   |      |      |      |
| <b>Learning outcomes:</b><br>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).      |       |   |      |      |      |
| <b>Class syllabus:</b><br>Applications of linear programming in statistics. Algorithm Nelder-Mead. Simulated annealing. Genetic algorithms. Particle swarm optimization. Basics of constrained global optimization.   |       |   |      |      |      |
| <b>Recommended literature:</b><br>Algorithmics for hard problems : Introduction to combinatorial optimization, randomization, approximation, and heuristics / Juraj Hromkovič. Berlin : Springer, 2003<br>Spall JC: Introduction to stochastic search and optimization. Wiley, 2003<br>Online materials of the lecturer |       |   |      |      |      |
| <b>Languages necessary to complete the course:</b><br>Slovak, English   |       |   |      |      |      |
| <b>Notes:</b>   |       |   |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 140   |       |   |      |      |      |
| A   | B     | C   | D    | E    | FX   |
| 62,86   | 18,57 | 9,29  | 5,71 | 2,14 | 1,43 |
| <b>Lecturers:</b> doc. Mgr. Radoslav Harman, PhD.   |       |   |      |      |      |

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| <b>Last change:</b> 08.05.2017                    |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc. |

## COURSE DESCRIPTION

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|---|-------|---|-------|------|------|
| <b>University:</b> Comenius University in Bratislava  |       |   |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics   |       |   |       |      |      |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-123/10   |       | <b>Course title:</b><br>Stochastic Simulation Methods |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning  |       |   |       |      |      |
| <b>Number of credits:</b> 3   |       |   |       |      |      |
| <b>Recommended semester:</b> 1., 3.   |       |   |       |      |      |
| <b>Educational level:</b> II.   |       |   |       |      |      |
| <b>Prerequisites:</b>   |       |   |       |      |      |
| <b>Course requirements:</b><br>Evaluation: project, oral examination<br>Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50%<br>Scale of assessment (preliminary/final): 80/20   |       |   |       |      |      |
| <b>Learning outcomes:</b><br>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. |       |   |       |      |      |
| <b>Class syllabus:</b><br>Generating realizations of random numbers, random variables and random vectors. Statistical analysis of simulation data. Basic Monte Carlo methods.   |       |   |       |      |      |
| <b>Recommended literature:</b><br>Ross S: Simulation, Elsevier Academic Press 2006<br>Fishman GS: Monte Carlo: Concepts, Algorithms and Applications, Springer 1996<br>Online materials of the lecturer   |       |   |       |      |      |
| <b>Languages necessary to complete the course:</b><br>Slovak, English   |       |   |       |      |      |
| <b>Notes:</b>   |       |   |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 309   |       |   |       |      |      |
| A   | B     | C   | D     | E    | FX   |
| 39,48   | 22,33 | 16,83   | 10,03 | 7,12 | 4,21 |
| <b>Lecturers:</b> doc. Mgr. Radoslav Harman, PhD.   |       |   |       |      |      |
| <b>Last change:</b> 08.05.2017  |       |   |       |      |      |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.   |       |   |       |      |      |

## COURSE DESCRIPTION

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|--|-----|---|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava   |     |   |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics  |     |   |     |     |     |
| <b>Course ID:</b><br>FMFI.KAMŠ/2-PMS-131/17  |     | <b>Course title:</b><br>Survival Analysis |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |   |     |     |     |
| <b>Number of credits:</b> 3  |     |   |     |     |     |
| <b>Recommended semester:</b> 2.  |     |   |     |     |     |
| <b>Educational level:</b> II.  |     |   |     |     |     |
| <b>Prerequisites:</b>  |     |   |     |     |     |
| <b>Course requirements:</b>  |     |   |     |     |     |
| <b>Learning outcomes:</b>  |     |   |     |     |     |
| <b>Class syllabus:</b>   |     |   |     |     |     |
| <b>Recommended literature:</b>   |     |   |     |     |     |
| <b>Languages necessary to complete the course:</b>   |     |   |     |     |     |
| <b>Notes:</b>  |     |   |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 5  |     |   |     |     |     |
| A  | B   | C   | D   | E   | FX  |
| 100,0  | 0,0 | 0,0                                       | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Lenka Filová, PhD.  |     |   |     |     |     |
| <b>Last change:</b>  |     |   |     |     |     |
| <b>Approved by:</b> prof. RNDr. Marek Fila, DrSc.  |     |   |     |     |     |