

Course descriptions

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COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-002/15	Course title: Analysis of Models in Financial Mathematics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: prof. RNDr. Daniel Ševčovič, DrSc.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-036/25	Course title: Applied Graph Theory
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Type, volume, methods and workload of the student - additional information 2 (seminar)	
Number of credits: 10	
Recommended semester: 3.	
Educational level: III.	
Prerequisites:	
Course requirements: Final exam will be oral. The questions on the final exam will be from the topics presented during the course. Grade scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): Weight of work during semester / final exam: Practical work during semester 80% / final exam 20%.Continual evaluation is based on quality of presentations and participation in discussions.	
Learning outcomes: After completion of this course the students will be acquainted with advanced topics from graph theory with interdisciplinary emphasis.	
Class syllabus: Students will present shorter parts of a monograph, and thus for continuity they will need to understand the preceding parts as well. Individual parts will have scope of not exceeding one meeting. In case of smaller number of enrolled students, the teacher will present material from the monograph as well.	
Recommended literature: Recommended literature will change on yearly basis. For year 2025/2026 the following monograph will be used: Krebs M., Shaheen A., Expander families and Cayley Graphs: A beginner's guide, Oxford University Press, 288 pages, ISBN 978-0199767113	
Languages necessary to complete the course: English	
Notes: This course is possible to complete remotely.	

Past grade distribution	
Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: doc. Mgr. Ondrej Šuch, PhD.	
Last change: 10.01.2025	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-014/00	Course title: Asymptotic Methods
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements: Interim assessment during the semester has a weight of 30% (homeworks 20%, bonus exercises 10%). The two semester exam papers have a total weight of 70% (the first paper taken in the middle of the semester, the second paper taken at the end of the semester). The student must obtain at least half of the points from each semester exam paper. The final evaluation can be adjusted by an oral exam (theoretical questions, written preparation). Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), FX (50-0) Scale of assessment (preliminary/final): 30/70	
Learning outcomes: To give an overview of basic asymptotic methods for solving algebraic and differential problems in applied mathematics.	
Class syllabus: Algebraic equations: Iterative method. Algebraic equations: Expansion method. Singular perturbations and rescaling. Logarithmic Poincare's expansions. Convergence and asymptoticity. Asymptotic approximation of integrals. Watson's lemma. The steepest descent method. Regular perturbation problems in differential equations. Singular perturbation problems in differential equations. Method of matched asymptotic expansions. Multiple scale method. WKBJ method. Poincare-Lindstedt method. Radius of convergence and Domb-Sykes plots.	
Recommended literature: E. J. Hinch: Perturbation Methods, Cambridge University Press, 1991 J. Kevorkian, J. D. Cole: Multiple Scale and Singular Perturbation Methods, Springer, 1996	
Languages necessary to complete the course: English	
Notes:	

Past grade distribution	
Total number of evaluated students: 9	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Peter Guba, PhD.	
Last change: 22.06.2022	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-005/00	Course title: Biomathematics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 3.	
Educational level: III.	
Prerequisites:	
Recommended prerequisites: 2-MAT-111 Dynamical Systems OR 2-MAT-112 Partial Differential Equations (1) OR 2-MAT-121 Partial Differential Equations (2)	
Course requirements: Continuous assessment: individual work Exam: final exam and project Assessment grade scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: Students will become familiar with the theory and techniques used in current research in mathematical biology and in mathematical models in the natural and social sciences in general. At the same time, students try to work on a separate project in this area. They will also gain new knowledge from population models, chemical kinetics and cell biology.	
Class syllabus: Principles of mathematical modeling, modeling goals, model building, model simulations, parameter selection, non-dimensionalization, model robustness, results analysis. Biochemical kinetics, enzymatic reactions, cooperativity, quasi-stationary approximation. Epidemiological models. Dynamics on neural and other cell membranes, Hodgkin-Huxley model, Fitzhugh-Nagumo model.	
Recommended literature: A primer on mathematical models in biology / Lee A. Segel, Leah Edelstein-Keshet. Philadelphia, Pa. : Society for Industrial and Applied Mathematics, 2013 Mathematical biology : 1. : An introduction / J. D. Murray. New York : Springer, 2002 Mathematical biology : 2. : Spatial models and biomedical applications / J. D. Murray. New York : Springer, 2003 Nonlinear dynamics and chaos : with applications to physics, biology, chemistry, and engineering / Steven H. Strogatz. Cambridge : Perseus Books, 1994	

Languages necessary to complete the course:	
Notes:	
Past grade distribution	
Total number of evaluated students: 7	
ABS	NEABS
100,0	0,0
Lecturers: doc. Mgr. Richard Kollár, PhD.	
Last change: 13.03.2022	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026							
University: Comenius University Bratislava							
Faculty:							
Course ID: FMFL.KJP/3-MXX-101/15				Course title: Course of English for PhD Studies (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning, distance learning							
Number of credits: 5							
Recommended semester: 1.							
Educational level: III.							
Prerequisites:							
Course requirements:							
Learning outcomes:							
Class syllabus:							
Recommended literature:							
Languages necessary to complete the course:							
Notes:							
Past grade distribution Total number of evaluated students: 239							
A	ABS	B	C	D	E	FX	NEABS
35,15	61,09	0,42	0,0	0,0	1,67	0,0	1,67
Lecturers: Mgr. Simona Dobiašová, PhD., Mgr. Aneta Barnes							
Last change: 13.01.2025							
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.							

COURSE DESCRIPTION

Academic year: 2025/2026							
University: Comenius University Bratislava							
Faculty:							
Course ID: FMFI.KJP/3-MXX-102/15				Course title: Course of English for PhD Studies (1)			
Educational activities: Type of activities: practicals Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning, distance learning							
Number of credits: 5							
Recommended semester: 2.							
Educational level: III.							
Prerequisites: FMFI.KJP/3-MXX-101/15 - Course of English for PhD Studies (1)							
Course requirements:							
Learning outcomes:							
Class syllabus:							
Recommended literature:							
Languages necessary to complete the course:							
Notes:							
Past grade distribution Total number of evaluated students: 210							
A	ABS	B	C	D	E	FX	NEABS
41,9	52,38	0,0	0,0	0,0	0,0	0,0	5,71
Lecturers: Mgr. Simona Dobiašová, PhD., Mgr. Aneta Barnes							
Last change: 13.01.2025							
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.							

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-806/15	Course title: Creation of Teaching Texts and Aids
Educational activities: Type of activities: independent work Number of hours: per week: 5 per level/semester: 70 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 22	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-203/10	Course title: Department Seminar (1)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 14	
ABS	NEABS
100,0	0,0
Lecturers: prof. RNDr. Daniel Ševčovič, DrSc., prof. RNDr. Pavol Quittner, DrSc., doc. RNDr. Margaréta Halická, CSc., prof. Mgr. Radoslav Harman, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-204/10	Course title: Department Seminar (2)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 13	
ABS	NEABS
100,0	0,0
Lecturers: prof. RNDr. Daniel Ševčovič, DrSc., doc. RNDr. Margaréta Halická, CSc., prof. RNDr. Pavol Quittner, DrSc., prof. Mgr. Radoslav Harman, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-205/10	Course title: Department Seminar (3)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 6.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 12	
ABS	NEABS
100,0	0,0
Lecturers: prof. RNDr. Daniel Ševčovič, DrSc., prof. RNDr. Pavol Quittner, DrSc., doc. RNDr. Margaréta Halická, CSc., prof. Mgr. Radoslav Harman, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-206/10	Course title: Department Seminar (4)
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 8.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 6	
ABS	NEABS
100,0	0,0
Lecturers: prof. RNDr. Daniel Ševčovič, DrSc., doc. RNDr. Margaréta Halická, CSc., prof. RNDr. Pavol Quittner, DrSc., prof. Mgr. Radoslav Harman, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-990/15	Course title: Dissertation Thesis Defense
Number of credits: 30	
Educational level: III.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-031/15	Course title: Fundamentals of Mathematical Modelling in Empirical Sciences
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers: doc. Mgr. Ján Mačutek, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-803/15	Course title: Guidance of a Final Thesis or of a Project for the Students' Conference
Educational activities: Type of activities: other Number of hours: per week: 5 per level/semester: 70 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 26	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-804/10	Course title: Guidance of the Students' Research Project
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 7	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers:	
Last change:	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-101/15	Course title: Individual Study of Science and Research Resources (1)
Educational activities: Type of activities: independent work Number of hours: per week: 10 per level/semester: 140 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 22	
ABS	NEABS
95,45	4,55
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-104/15	Course title: Individual Study of Science and Research Resources (2)
Educational activities: Type of activities: independent work Number of hours: per week: 10 per level/semester: 140 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 23	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-001/15	Course title: Interior-point methods in linear programming
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 1.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 3	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Margaréta Halická, CSc.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-035/24	Course title: Introduction to Classification Methods
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Type, volume, methods and workload of the student - additional information 2 (seminar)	
Number of credits: 10	
Recommended semester: 1.	
Educational level: III.	
Prerequisites:	
Course requirements: Final exam will be oral. The questions on the final exam will be from the topics presented during the course. Grade scale: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): Weight of work during semester / final exam: Practical work during semester 80% / final exam 20%.	
Learning outcomes: After completion of this class the students will be acquainted with classification methods from statistics and machine learning, as well as with mathematical principles on which they are based.	
Class syllabus: Students will present shorter parts of a monograph, and thus for continuity they will need to understand the preceding parts as well. Individual parts will have scope of not exceeding one meeting. In case of smaller number of enrolled students, the teacher will present material from the monograph as well. Covered topics include: concept of a classification model, evaluation of models, linear and tree models, linear discriminant analysis (LDA), logistic regression, inference about statistical models, crossentropy, support vector machines.	
Recommended literature: James G., Witten D., Hastie T., Tibshirani R. An introduction to statistical learning: with applications in R, Springer Nature, 2021, 622 strán, ISBN 978-10716114181	
Languages necessary to complete the course: English	
Notes: This course is possible to complete remotely.	

Past grade distribution	
Total number of evaluated students: 5	
ABS	NEABS
100,0	0,0
Lecturers: doc. Mgr. Ondrej Šuch, PhD.	
Last change: 10.01.2025	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-009/15	Course title: Models of Fluids Dynamics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 3.	
Educational level: III.	
Prerequisites:	
Course requirements: Interim assessment during the semester has a weight of 30% (homeworks 20%, bonus exercises 10%). The two semester exam papers have a total weight of 70% (the first paper taken in the middle of the semester, the second paper taken at the end of the semester). The student must obtain at least half of the points from each semester exam paper. The final evaluation can be adjusted by an oral exam (theoretical questions, written preparation). Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), FX (50-0) Scale of assessment (preliminary/final): 30/70	
Learning outcomes: Teach the students to derive and analyse basic equations describing fluid flow.	
Class syllabus: Equations of motion for ideal fluids. Vorticity. Irrotational flow. Vorticity equation. Equations of motion for viscous fluids. Examples of simple viscous flows. Flows with circular streamlines. Convection and diffusion of vorticity. Gravity waves. Dispersion and group velocity. Surface tension effects and capillary waves. Internal gravity waves. Waves with finite amplitude. Hydraulic shocks and solitary waves. Kelvin--Helmholtz instability. Thermal convection. Centrifugal instability. Theorem on the stability of shear flow. General theorem on the stability of viscous flow. Uniqueness of steady viscous flow. Transition to turbulence.	
Recommended literature: D. J. Acheson: Elementary Fluid Dynamics, Oxford, Clarendon Press, 1990 G. K. Batchelor: An Introduction to Fluid Dynamics, Cambridge University Press, 2000 P. Guba: Dynamika tekutín, skriptá, FMFI UK, 2021	
Languages necessary to complete the course: English	
Notes:	

Past grade distribution	
Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Peter Guba, PhD.	
Last change: 22.06.2022	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-007/15	Course title: Modern Methods of Convex Optimisation
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements: The student actively participates in the course and gives a talk on an agreed topic. Scale of assessment (preliminary/final): 100% /0	
Learning outcomes: Students become familiar with new fields of convex optimization and with modern algorithmic approaches for solving these problems. They will become familiar with the newest results, trends and open problems in convex optimization.	
Class syllabus: Conic convex programming, duality theory on conic convex programming, applications of conic programming in various areas, Theory of interior point methods, interior-point algorithms vor large scale conic problems, conic relaxations.	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 6	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Mária Trnovská, PhD.	
Last change: 16.06.2022	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-024/10	Course title: Nonlinear Statistical Models
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 10	
ABS	NEABS
100,0	0,0
Lecturers: doc. Mgr. Lenka Filová, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-037/25	Course title: Numerical modelling transport processes
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Type, volume, methods and workload of the student - additional information Type of activities: course Number of hours: per week: 2 per level/semester: 26	
Number of credits: 10	
Recommended semester: 3.	
Educational level: III.	
Prerequisites:	
Recommended prerequisites: 2-EFM-107/15 Partial differential equations 2-EFM-101/15 Numerical modelling 3-MAM-009/15 Fluid flow models	
Course requirements: Exam: oral Grading: A (100-91), B (90-81), C (80-71), D (70-61), E (60-51), FX (50-0) Scale of assessment (preliminary/final): 30/70	
Learning outcomes: Students are introduced to the finite volume method for the numerical solution of partial differential equations describing diffusion and advection problems in applied mathematics.	
Class syllabus: Introduction to the finite volume method 1. Discretization schemes for advection-diffusion equations (central, upwind and hybrid differencing schemes) 2. Properties of the discretization schemes (conservativeness, boundedness and transportiveness) 3. Solution algorithms for pressure-velocity coupling (SIMPLE and PISO algorithms) 4. Direct and iterative methods for solving discretised equations (TDMA, Jacobi and Gauss–Seidel methods) Application of OpenFOAM® software in solving fluid dynamics problems 5. The heat transfer equation 6. The Navier–Stokes equations for single-phase incompressible flows 7. Lid-driven cavity flow 8. Poiseuille flow Meshing for complex geometries with OpenFOAM® 9. Flow around a cylinder. Von Kármán vortex street 10. Single-phase flow in the pore space. Scalar and particulate transport in the pore space Application of OpenFOAM® software in solving problems in financial mathematics and biomathematics 11. The Black–Scholes equation for option pricing 12. The Fisher–KPP equation for population dynamics	

Recommended literature: S. V. Patankar: Numerical Heat Transfer and Fluid Flow, CRC Press, 2018 F. Moukalled, L. Mangani and M. Darwish: The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab®, Springer, 2016 H. K. Versteeg and W. Malalasekera: An Introduction to Computational Fluid Dynamics: The Finite Volume Method, Pearson, 2007	
Languages necessary to complete the course: Slovak, English	
Notes:	
Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: Mgr. Radoslav Hurtiš, PhD., doc. RNDr. Peter Guba, PhD.	
Last change: 01.05.2025	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-701/15	Course title: Obtaining the Comenius University Grant for the Young
Educational activities: Type of activities: independent work Number of hours: per week: 20 per level/semester: 280 Form of the course: on-site learning	
Number of credits: 20	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 16	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-805/10	Course title: Participation in a Conference Organising Committee
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 3	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 4	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

STATE EXAM DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-950/15	Course title: Passing Dissertation Examination
Number of credits: 20	
Educational level: III.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-403/15	Course title: Presentation at a Homeland Conference or Department Seminar
Educational activities: Type of activities: independent work Number of hours: per week: 5 per level/semester: 70 Form of the course: on-site learning	
Number of credits: 5	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 25	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-401/15	Course title: Presentation at an International Conference
Educational activities: Type of activities: independent work Number of hours: per week: 20 per level/semester: 280 Form of the course: on-site learning	
Number of credits: 20	
Recommended semester: 8.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 30	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-018/10	Course title: Probability Theory
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 1.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 9	
ABS	NEABS
88,89	11,11
Lecturers: prof. RNDr. Anatolij Dvurečenskij, DrSc.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-302/15	Course title: Publication in a Reviewed Periodical or Reviewed Almanac
Educational activities: Type of activities: independent work Number of hours: per week: 15 per level/semester: 210 Form of the course: on-site learning	
Number of credits: 15	
Recommended semester: 6.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 15	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-301/15	Course title: Publication in an A-category Periodical
Educational activities: Type of activities: independent work Number of hours: per week: 30 per level/semester: 420 Form of the course: on-site learning	
Number of credits: 30	
Recommended semester: 6.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 11	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-030/15	Course title: Random Dynamic Systems
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Katarína Janková, CSc.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-706/15	Course title: Response to a Publication
Educational activities: Type of activities: other Number of hours: per week: 3 per level/semester: 42 Form of the course: on-site learning	
Number of credits: 3	
Recommended semester: 8.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-704/15	Course title: Response to a WoK- or SCOPUS-registered Publication
Educational activities: Type of activities: other Number of hours: per week: 6 per level/semester: 84 Form of the course: on-site learning	
Number of credits: 6	
Recommended semester: 8.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 1	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-702/15	Course title: Scientific Project Co-researcher
Educational activities: Type of activities: independent work Number of hours: per week: 10 per level/semester: 140 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 28	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-003/00	Course title: Selected Topics from Financial Mathematics
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus: - Selected interest rate models - Multi-period models of portfolio theory - Derivative pricing with transaction costs - Portfolio risk management	
Recommended literature: Wilmott, P., Dewynne, J, Howison, S.: Option Pricing, Mathematical Models and Computations, UK: Oxford Financial Press, 1995 Kwok, Y.K.: Mathematical models of financial derivatives, Berlin, Springer Verlag, 1998. Hull, J.: Options, futures and other derivative securities, New York, Prentice Hall, 1989.	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 8	
ABS	NEABS
100,0	0,0
Lecturers: doc. Mgr. Igor Melicherčík, PhD.	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-033/23	Course title: Selected Topics from Survival Analysis
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Type, volume, methods and workload of the student - additional information lectures	
Number of credits: 10	
Recommended semester: 1., 3.	
Educational level: III.	
Prerequisites:	
Course requirements: project Scale of assessment (preliminary/final): 100/0	
Learning outcomes: Students will gain knowledge on selected statistical methods in survival analysis and how to use them when analyzing censored data	
Class syllabus: Censoring, survival function and hazard function. Discrete time models. Nonparametric estimates. Kaplan-Meier estimate. Comparing two survival datasets. Log-rank test. Wilcoxon test. Proportional hazards model. Likelihood function for proportional hazards model parameters. Weibull model as a proportional hazards model. Log-linear form of the Weibull distribution. More distributions used in survival analysis. Diagnostics in proportional hazards model. Cox-Snell residuals. Martingale residuals. Aft (accelerated failure time) models. Cox regression model. Models with time-dependent explanatory variables.	
Recommended literature: Collett, David. Modelling survival data in medical research. CRC press, 2015. Klein, John P., et al., eds. Handbook of survival analysis. Boca Raton, FL.: CRC Press, 2014. Broström, G. Event history analysis with R. Chapman and Hall/CRC, 2021	
Languages necessary to complete the course: Slovak, English	
Notes:	

Past grade distribution	
Total number of evaluated students: 6	
ABS	NEABS
100,0	0,0
Lecturers: doc. Mgr. Lenka Filová, PhD.	
Last change: 16.05.2023	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-025/10	Course title: Simulation Methods
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 2., 4.	
Educational level: III.	
Prerequisites:	
Course requirements: Preliminary semester evaluation: projects Final examination: oral examination Approximate grade thresholds: A 90%, B 80%, C 70%, D 60%, E 50% Scale of assessment (preliminary/final): 50/50	
Learning outcomes: After completing the course, students will be able to use advanced techniques of variance reduction and simulation generation of random vectors and processes.	
Class syllabus: Selected methods of simulation sampling of random vectors and random processes (uniform and non-uniform generation on the surface and in the interior of multi-dimensional spheres and polyhedrons, sampling of processes used in financial mathematics). Advanced variance reduction techniques and simulation of rare events.	
Recommended literature: Ross S: Simulation, Elsevier Academic Press 2006 Fishman GS: Monte Carlo: Concepts, Algorithms and Applications, Springer 1996 Selected scientific papers	
Languages necessary to complete the course: Slovak, English	
Notes:	
Past grade distribution Total number of evaluated students: 16	
ABS	NEABS
93,75	6,25
Lecturers: prof. Mgr. Radoslav Harman, PhD.	

Last change: 08.05.2017
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-019/10	Course title: Stochastic Models in Insurance and Actuarial Science
Educational activities: Type of activities: lecture Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 10	
Recommended semester: 3.	
Educational level: III.	
Prerequisites:	
Course requirements: During the semester the student can get 100% points for one written exam, which is usually written at the end of the semester. Grade thresholds: A: 100.00% – 90.00%; B: 89.99% – 80.00%; C: 79.99% – 70.00%; D: 69.99% – 60.00%; E: 59.99% – 50.00%; Fx: 49.99% – 0.00%. Scale of assessment (preliminary/final): Practical work during semester 100% / final exam 0%.	
Learning outcomes: After completing the course, the student will gain a detailed overview of ruin theory and the Cramér-Lundberg model. He or she will be able to approximate the ruin probability of the insurance company even if the claim size distribution has a heavy right tail. In addition, the student will know the various generalizations of the strong law of large numbers that are used in the field of non-life insurance.	
Class syllabus: Probability distributions of small and large claims. Heavy tailed probability distributions: subexponential distributions, long tailed distributions, regularly varying distributions, distributions with fat tails. Risk process in non-life insurance. Cramér-Lundberg model, Cramér-Lundberg theorem. Probability of ruin of an insurance company in finite and infinite time. Generalized versions of the strong law of large numbers. Law of the iterated logarithm.	
Recommended literature: Mathematical Methods in Risk Theory / Hans Bühlmann. New York : Springer, 1996; Modern Actuarial Risk Theory Using R / Rob Kaas, Marc Goovaerts, Jan Dhaene, Michel Denuit. Second Edition, Heidelberg : Springer-Verlag, 2008; Insurance Risk and Ruin / David C. M. Dickson. First Edition, New York : Cambridge University Press, 2005; Non-Life Insurance Mathematics / Thomas Mikosch. Second Edition, Heidelberg : Springer-Verlag, 2009.	
Languages necessary to complete the course: Slovak, English	

Notes:	
Past grade distribution	
Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: Mgr. Gábor Szűcs, PhD., doc. RNDr. Katarína Janková, CSc.	
Last change: 15.06.2022	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-807/10	Course title: Study Stay Abroad
Educational activities: Type of activities: Number of hours: per week: per level/semester: Form of the course: on-site learning	
Number of credits: 3	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 2	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change:	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-802/15	Course title: Teaching Practice in the Summer Semester
Educational activities: Type of activities: other Number of hours: per week: 8 per level/semester: 112 Form of the course: on-site learning	
Number of credits: 8	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 57	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-801/15	Course title: Teaching Practice in the Winter Semester
Educational activities: Type of activities: other Number of hours: per week: 8 per level/semester: 112 Form of the course: on-site learning	
Number of credits: 8	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 72	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-034/24	Course title: Theory of Dynamic Equations and Inequalities on Time scales
Educational activities: Type of activities: course Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Type, volume, methods and workload of the student - additional information 2 (lectures)	
Number of credits: 10	
Recommended semester: 4.	
Educational level: III.	
Prerequisites:	
Course requirements: Exam: oral Scale of assessment (preliminary/final): 0/100	
Learning outcomes: Students will learn the basics of the dynamic calculus on time scales with a focus on the principles underlying dynamic equations and inequalities on time scales.	
Class syllabus: 1. Fundamentals of time scale calculus. 2. Differential calculus for single-variable functions on time scales. 3. Integral calculus for single-variable functions on time scales. 4. Introduction to dynamic equations: basic concepts, existence and uniqueness theorems. 5. Introduction to dynamic inequalities: overview of fundamental inequalities on time scales and their significance.	
Recommended literature: 1. Bohner, M. and Allan Peterson Dynamic Equations on Time Scales: An Introduction with Applications. Birkhauser, 2001. 2. Bohner, Martin, and Allan Peterson. "Advances in Dynamic Equations on Time Scales, Birkhauser, 2003 3. Agarwal, Ravi, Donal O'Regan, and Samir Saker. Dynamic inequalities on time scales. Vol. 2014. Cham: Springer, 2014.	
Languages necessary to complete the course:	
Notes:	

Past grade distribution	
Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: Ing. Irena Jadlovská, PhD.	
Last change: 10.01.2025	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	

COURSE DESCRIPTION

Academic year: 2025/2026	
University: Comenius University Bratislava	
Faculty:	
Course ID: FMFI.KAMŠ/3-MAM-808/15	Course title: Writing Final Thesis Assessment Protocol
Educational activities: Type of activities: independent work Number of hours: per week: 2 per level/semester: 28 Form of the course: on-site learning	
Number of credits: 2	
Recommended semester:	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	
Past grade distribution Total number of evaluated students: 35	
ABS	NEABS
100,0	0,0
Lecturers:	
Last change: 02.06.2015	
Approved by: prof. RNDr. Daniel Ševčovič, DrSc.	