

**Course information sheets arranged in a sequence of compulsory and optional courses according to the recommended full-time / part-time study plan**

Study programme: **Mathematical analysis**

Field of study: **Mathematics**

Degree of study: **3rd. degree**

**List of courses**

**STUDY PART**

**Compulsory courses**

Research methodology and ethics

Topology

**Compulsory optional courses**

Real analysis

Measure and integral

Complex analysis

Functional analysis

Differential equations

Dynamical systems

Ergodic theory

Fuzzy mathematical analysis

**SCIENTIFIC PART**

**Compulsory courses**

Scientific Seminar 1

Scientific Seminar 2

Scientific Seminar 3

Scientific Seminar 4

Scientific Seminar 5

Scientific Seminar 6

Scientific Seminar 7

Scientific Seminar 8

State examination, Dissertation Examination

Publication registered in the WoS or Scopus databases (at least in printing queue before the defence)

Dissertation Thesis and Defence

**Compulsory optional courses**

Another publication registered in the WoS or Scopus databases (at least in printing queue before the defence)

Publication registered in MathSciNet (WoS or Scopus record not necessary)

Another publication registered in MathSciNet (WoS or Scopus record not necessary)

Reference in WoS or Scopus

Another reference in WoS or Scopus

Reference (WoS or Scopus record not necessary)

Another reference (WoS or Scopus record not necessary)

Active participation in a scientific conference with international participation

Active participation in another scientific conference with international participation

Active participation in a scientific conference (international participation not required)

Active participation in another scientific conference (international participation not required)

Invite for a presentation at a scientific seminar outside of MBU (with the exception of 3d-MAs-103 up to 3d-MAs-110)

Another invite for a presentation at a scientific seminar outside of MBU (with the exception of 3d-MAs-103 up to 3d-MAs-110)

Completion of a summer/winter school for doctoral candidates

Completion of another summer/winter school for doctoral candidates

Participation in a research grant project in the first year (researcher)

Participation in a research grant project in the second year (researcher)

Participation in a research grant project in the third year (researcher)

Another scientific seminar (at least 1 semester, with the exception of 3d-MAs-103 up to 3d-MAs-110)

## STUDY PART

### Compulsory courses

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d-MAe-101 EFŠ: KMA FPV/3e-MAe-101			<b>Course name:</b> Research methodology and ethics		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 0-24-0-0/semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), external (EFŠ)					
<b>Number of credits:</b> 8					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 2nd semester					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student has an adequately built-up ability to use the most effective methods and procedures in independent scientific work as well as in cooperation on joint scientific projects in mathematics. The student has established principles of ethical behaviour in science and research.</i>					
<b>Course contents:</b> <i>Concepts, symbols, abstraction, generalization. Techniques and methods of proof. Selection of a mathematical problem and possible approaches to the solution. Principles of effective writing of a mathematical text. Ethical aspects of scientific research. Correct citation of sources and issues of plagiarism.</i>					
<b>Recommended literature:</b> <ol style="list-style-type: none"><li>1. P. Davis, R. Hersh, E. Marchisotto: The Mathematical Experience, Springer</li><li>2. S. Krantz: A Primer of Mathematical Writing, 2<sup>nd</sup> Edition, American Mathematical Society 2017</li><li>3. Ethics in Mathematics <a href="https://everything.explained.today/Ethics_in_mathematics/">https://everything.explained.today/Ethics_in_mathematics/</a></li><li>4. Ethical Guidelines of the American Mathematical Society <a href="https://www.ams.org/about-us/governance/policy-statements/sec-ethics">https://www.ams.org/about-us/governance/policy-statements/sec-ethics</a></li><li>5. Code of Practice of the European Mathematical Society <a href="https://euro-math-soc.eu/system/files/uploads/COP-approved.pdf">https://euro-math-soc.eu/system/files/uploads/COP-approved.pdf</a></li></ol>					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> <i>new course</i>					
A	B	C	D	E	FX
<b>Remarks – student's workload:</b> 240 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 24 hours</i> <i>self-study: 216 hours</i>					
<b>Teacher:</b> lectures/tutorials/seminars: doc. RNDr. Roman Hric, PhD. <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> prof. RNDr. Eubomír Snoha, DSc., DrSc.					

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d- MAe-102 EFŠ: KMA FPV/3e- MAe-102			<b>Course name:</b> Topology		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0 /semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), <i>external (EFŠ)</i>					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: 1st sem.					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Topological spaces and continuous functions. Connectedness and compactness. Countability and separation axioms. The Tychonoff theorem, the Stone-Čech compactification. Metrizable spaces. Complete metric spaces and function spaces. Baire spaces and the Baire category method. Introduction to dimension theory. The fundamental group. Surfaces. Covering spaces.</i>					
<b>Recommended literature:</b> 1. MUNKRES, J. R., Topology, Prentice Hall, New York 2000. 2. ENGELKING, R., Topology, Heldermann, Berlin 1989, 3. NADLER, S. B.: Continuum theory, Marcel Dekker, New York 1992, 4. WHYBURN, G. T.: Analytic topology, Amer. Math. Soc., New York 1942, 5. OXToby, J. C.: Measure and category, Springer Verlag, 2nd ed. 1980, 6. HATCHER, A.: Algebraic topology, Cambridge University Press 2001, 7. MUNKRES, J. R.: Elements of algebraic topology, Westview Press 1993.					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> <i>new course</i>					
A	B	C	D	E	FX
<b>Remarks - student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: doc. RNDr. Vladimír Špitalský, PhD.; prof. RNDr. Miroslav Haviar, CSc.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Eubomír Snoha, DSc., DrSc.</i>					

## Compulsory optional courses

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d- MAe-201 EFŠ: KMA FPV/3e- MAe-201			<b>Course name:</b> Real analysis		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0 /semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), <i>external (EFŠ)</i>					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th sem.					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Measure, measurable functions, integral, Fubini's theorem. Differentiation. Metric spaces, contraction maps, function approximation. The Baire category theorem, topologically complete spaces. Borel and analytic sets. Normed linear spaces, linear operators, Banach spaces. Fundamental theorems of functional analysis (the Hahn-Banach theorem, ...). The <math>L_p</math> spaces, Hilbert spaces, Fourier series.</i>					
<b>Recommended literature:</b> 1. M BRUCKNER, M., BRUCKNER, J. B., THOMSON, B. S.: Real analysis. Prentice-Hall 1997. 2. RUDIN, W.: Real and complex analysis, 3rd ed. McGraw-Hill 1986.					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> <i>new course</i>					
A	B	C	D	E	FX
<b>Remarks - student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: doc. RNDr. Vladimír Špitalský, PhD.;</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Eubomír Snoha, DSc., DrSc.</i>					

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d-MAe-202 EFŠ: KMA FPV/3e-MAe-202			<b>Course name:</b> Measure and integral		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0/semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), external (EFŠ)					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th semester					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Families of sets and measure, Lebesgue and Lebesgue-Stieltjes measure. Measurable functions, convergence on spaces with measure. Lebesgue integral, spaces of integrable functions, Riesz duality. Linear functionals, Riemann-Stieltjes integral. Product of measures, Fubini's theorem. Radon-Nikodym theorem. Borel and Baire measures, regularity. Radon measures. Invariant measures, Haar measure, entropy.</i>					
<b>Recommended literature:</b> 1. A. Bruckner, J. Bruckner, B. Thomson: Real Analysis, 2 <sup>nd</sup> Edition, 2008 <a href="http://classicalrealanalysis.info/com/">http://classicalrealanalysis.info/com/</a> 2. B. Simon: Real Analysis, American Mathematical Society 2015 3. H. Federer: Geometric Measure Theory, Springer 1969					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> <i>new course</i>					
A	B	C	D	E	FX
<b>Remarks – student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: doc. RNDr. Roman Hric, PhD.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d-MAe-203 EFŠ: KMA FPV/3e-MAe-203			<b>Course name:</b> Complex analysis		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0/semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), external (EFŠ)					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th semester					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Holomorphic and analytical functions. Power, Taylor and Laurent series. Singularities of holomorphic functions, residues, meromorphic functions. Applications of residue calculus. Harmonic functions. Conformal maps, non-Euclidean geometries, Riemann's theorem. Analytical extensions, Riemann zeta function, Riemann hypothesis. Elements of complex dynamics.</i>					
<b>Recommended literature:</b> 1. L. Ahlfors: Complex Analysis, 3 <sup>rd</sup> Edition, McGraw-Hill 1979 2. T. Needham: Visual Complex Analysis, Oxford University Press 1997 3. R. Rodríguez, I. Kra, J. Gilman: Complex Analysis, 2 <sup>nd</sup> Edition, Springer 2013 4. L. Carleson, T. Gamelin: Complex Dynamics, Springer 1993					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> <i>new course</i>					
A	B	C	D	E	FX
<b>Remarks – student's workload:</b> <i>540 hours</i> <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: doc. RNDr. Roman Hric, PhD.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d-MAe-204 EFŠ: KMA FPV/3e-MAe-204			<b>Course name:</b> Functional analysis		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0 /semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), <i>external (EFŠ)</i>					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th semester					
<b>Degree of study:</b> third degree					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral commission exam.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Normed linear spaces. Quotient normed linear space. Continuous linear operators and functionals. Dual space. Isomorphism and equivalence of norms. Finite-dimensional spaces. Riesz lemma. Analytic versions of the Hahn-Banach theorem. Reflexivity. Geometric versions of the Hahn-Banach theorem. Baire theorem and its consequences. Uniform boundedness principle and Banach-Stainhaus theorem. Open mapping theorem and its consequences. Closed graph theorem. Lebesgue spaces and their completeness. Hilbert spaces. Orthogonal complements and orthogonal projections. Fréchet-Riesz theorem and reflexivity of Hilbert spaces. Orthogonal series. Parseval's identity and Bessel's inequality. Hermitian, normal and unitary operators.</i>					
<b>Recommended literature:</b> 1. S. Kesavan, <i>Functional analysis. Second edition</i> , Hindustan Book Agency, New Delhi, 2017. 2. A. M. Bruckner, J. B. Bruckner, B. S. Thomson, <i>Real analysis: second edition</i> , CreateSpace Independent, 2008. 3. E. Kreyszig, <i>Introductory functional analysis with applications. Wiley Classics Library</i> , John Wiley & Sons, Inc., New York, 1989. 4. W. Rudin, <i>Functional analysis. Second edition</i> , International Series in Pure and Applied Mathematics, McGraw-Hill, Inc., New York, 1991.					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> new course					
A	B	C	D	E	FX
<b>Remarks - student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i> <i>Since the contents of the course "Real Analysis" significantly overlaps with the contents of the course "Functional Analysis", it is recommended that the students choose at most one of them.</i>					
<b>Teacher:</b> <i>lectures/consultations/seminars: Prof. RNDr. Ľubomír Snoha, DSc. DrSc., Prof. RNDr. Vladimír Janiš, CSc.</i> <i>language: English</i>					
<b>Date of last change:</b> 17. 8. 2022					
<b>Approved:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					



<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d-MAe-205 EFŠ: KMA FPV/3e-MAe-205			<b>Course name:</b> Differential equations		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0/semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), external (EFŠ)					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th semester					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Phase space, vector field, phase flow, integral curves of directional field. Linearization and stability of equilibria of ordinary differential equations. Action of diffeomorphism on directional field and phase flow. Rectification of directional field, existence, uniqueness and extension of solutions of ordinary differential equations. Derivative according to vector field and first integrals. Linear, quasilinear and nonlinear partial differential equations. Weak solutions of partial differential equations and Sobolev spaces. Partial differential equations as dynamical systems on infinite dimensional spaces. Differential equations on manifolds, vector fields and phase flows on manifolds.</i>					
<b>Recommended literature:</b> 5. V. Arnold: Ordinary Differential Equations, Springer 1992 6. V. Arnold: Geometrical Methods in the Theory of Ordinary Differential Equations, 2 <sup>nd</sup> Edition, Springer 1988 7. C. Chicone: Ordinary Differential Equations with Applications, 2 <sup>nd</sup> Edition, Springer 2006 8. F. John: Partial Differential Equations, 4 <sup>th</sup> Edition, Springer 1982					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> <i>new course</i>					
A	B	C	D	E	FX
<b>Remarks – student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: doc. RNDr. Roman Hric, PhD.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d- MAe-206 EFŠ: KMA FPV/3e- MAe-206			<b>Course name:</b> Dynamical systems		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0 /semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), <i>external (EFŠ)</i>					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th sem.					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> The notion of a dynamical system (with discrete time, with continuous time, topological transformation group/semigroup). Basic notions (periodic points, invariant sets, transitivity, minimality, limit sets, conjugacy and factor maps, equicontinuity, mixing). Dynamical systems on the real line (the Markov graph of a periodic orbit, Sharkovsky theorem, transitivity of maps of an interval). Limit behaviour (limit sets, attraction, stability). Recurrent behaviour (recurrent points, syndetically recurrent points and minimal sets, non-wandering points, chain-recurrence). Shift systems (shift spaces, subshifts and graphs, properties of subshifts). Symbolic representations, coding. Chaotic behaviour (sensitivity, scrambled sets, horseshoes). Topological entropy (equivalent definitions, properties, positive entropy versus horseshoes).					
<b>Recommended literature:</b> 1. DE VRIES, J.: Topological Dynamical Systems. De Gruyter, Berlin, 2014. 2. HASSELBLATT, B., KATOK, A.: A First Course in Dynamics. Cambridge University Press 2003. 3. BLOCK, L. S., COPPEL, W. A.: Dynamics in One Dimension. Springer-Verlag 1992. 4. KÚRKA, P.: Topological and Symbolic Dynamics. Société Mathématique de France 2003. 5. BRIN, M., STUCK, G.: Introduction to Dynamical Systems, Cambridge University Press 2002. 6. BROER, H., TAKENS, F.: Dynamical Systems and Chaos. Springer 2011.					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> new course					
A	B	C	D	E	FX
<b>Remarks - student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: prof. RNDr. Lubomír Snoha, DSc., DrSc., doc. RNDr. Vladimír Špitalský, PhD.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					

<b>Approved:</b> <i>prof. RNDr. Lubomír Snoha, DSc., DrSc.</i>					
<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d- MAe-207 EFŠ: KMA FPV/3e- MAe-207			<b>Course name:</b> Ergodic theory		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory optional <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0 /semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), <i>external (EFŠ)</i>					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th sem.					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> Measure-preserving transformations, ergodic theorem, mixing. Isomorphism, conjugacy, spectral isomorphism. Measure-preserving transformations with discrete spectrum. Entropy. Elements of topological dynamics. Invariant measures for continuous transformations. Topological entropy and its relationship to measure-theoretic entropy. Topological pressure.					
<b>Recommended literature:</b> 1. WALTERS, P.: An Introduction to Ergodic Theory. Springer-Verlag, New York-Berlin, 1982. 2. VIANA, M., OLIVEIRA, K.: Foundations of ergodic theory. Cambridge University Press, Cambridge, 2016. 3. HAWKINS, J.: Ergodic dynamics - from basic theory to applications. Springer 2021. 4. EINSIEDLER, M., WARD, T.: Ergodic theory with a view towards number theory. Springer-Verlag, London, 2011.					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> new course					
A	B	C	D	E	FX
<b>Remarks - student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: prof. RNDr. Lubomír Snoha, DSc., DrSc., doc. RNDr. Roman Hric, PhD.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Eubomír Snoha, DSc., DrSc.</i>					

<b>University:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Code:</b> DFŠ: KMA FPV/3d- MAe-208 EFŠ: KMA FPV/3e- MAe-208			<b>Course name:</b> Fuzzy mathematical analysis		
<b>Type, workload and methods of educational activities</b> <b>Course type:</b> compulsory <b>Recommended workload L-S-E-LW:</b> DFŠ, EFŠ: 24-12-0-0 /semester <b>Method of study:</b> combined <b>Form of study:</b> full time (DFŠ), <i>external (EFŠ)</i>					
<b>Number of credits:</b> 18					
<b>Recommended semester:</b> DFŠ/EFŠ: by the end of the 4th sem.					
<b>Degree of study:</b> third (PhD)					
<b>Prerequisite courses:</b>					
<b>Conditions for passing and completing the course:</b> <i>Oral exam.</i> <i>The evaluation of the subject is in accordance with the classification scale determined by the UMB study regulations.</i>					
<b>Learning outcomes:</b> <i>The student masters the subject to the required extent and to such a depth which enables to read scientific works in this field and to use the acquired knowledge and methods in scientific work in this field and in other disciplines of mathematical analysis. The student is ready for independent further education in this subject.</i>					
<b>Course contents:</b> <i>Representation of fuzzy sets, alpha-cuts. Extension principle. Triangular norms and conorms, aggregation functions. Fuzzy quantities and operations with them. Fuzzy relations. Projections and cylindric extensions. Equivalences, compatibilities and orderings. Composition of fuzzy relations. Multiple valued logics, approximate reasoning. Mamdani and Takagi-Sugeno controllers. Elements of the pattern recognition.</i>					
<b>Recommended literature:</b> 1. Klir, G.J., Yuan, B.: Fuzzy sets and fuzzy logic, theory and applications. Prentice Hall, New Jersey, 1995. 2. Klement, E.P., Mesiar, R., Pap, E.: Triangular norms. Springer, 2000. 3. Bandemer, H., Gottwald, S.: Fuzzy sets, fuzzy logic, fuzzy methods with applications, Wiley, 1995.					
<b>Language whose knowledge is needed to complete the course:</b> <i>English</i>					
<b>Evaluation of students in the past:</b> new course					
A	B	C	D	E	FX
<b>Remarks - student's workload:</b> 540 hours <b>DFŠ/EFŠ</b> <i>combined study (L, S, E/LW, tutorials): 36 hours</i> <i>self-study: 504 hours</i>					
<b>Teacher:</b> <i>lectures/tutorials/seminars: : prof. RNDr. Vladimír Janiš, CSc.</i> <i>language: English</i>					
<b>Date of last change:</b> 28. 2. 2022					
<b>Approved:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					

## SCIENTIFIC PART

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-103 EFS: KMA FPV/3e-MAs-103	<b>Course name:</b> Scientific Seminar 1
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 1st semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> prof. RNDr. Lubomír Snoha, DSc., DrSc.	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-104 EFS: KMA FPV/3e-MAs-104	<b>Course name:</b> Scientific Seminar 2
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 2nd semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> prof. RNDr. Ľubomír Snoha, DSc., DrSc.	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-105 EFS: KMA FPV/3e-MAs-105	<b>Course name:</b> Scientific Seminar 3
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 3rd semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, ask the speaker relevant questions, follow and participate in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-106 EFS: KMA FPV/3e-MAs-106	<b>Course name:</b> Scientific Seminar 4
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 4th semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	



<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-107 EFS: KMA FPV/3e-MAs-107	<b>Course name:</b> Scientific Seminar 5
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 5th semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-108 EFS: KMA FPV/3e-MAs-108	<b>Course name:</b> Scientific Seminar 6
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 6th semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-109 EFS: KMA FPV/3e-MAs-109	<b>Course name:</b> Scientific Seminar 7
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 7th semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-110 EFS: KMA FPV/3e-MAs-110	<b>Course name:</b> Scientific Seminar 8
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> 24 hours/semester <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: 8th semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Assessment: completed/not completed</i>	
<b>Learning outcomes (performance standard):</b> <i>Follow comprehensively the presentation of their colleagues' results, asks relevant questions to the speaker, follows and participates in the creative activities of the group, Students report on foreign and own results and answer relevant questions asked by other seminar participants.</i>	
<b>Brief outline of the course:</b> <i>The regular scientific seminar is attended based on the interest by the selected members of the relevant workplace (at MBU or elsewhere), regular as well as occasional guests from other workplaces in Slovakia or abroad. Students give reports on research papers from a relevant scientific field, selected chapters from monographs, research results obtained by other seminar participants.</i>	
<b>Recommended literature:</b> journals and monographs from the relevant part of mathematical analysis, according to recommendations given by the seminar instructor and the supervisor.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 24 hours</i> <i>self-study: 126 hours</i>	
<b>Instructor:</b> <i>supervisor, seminar instructor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Course code:</b> IFS: KMA FPV/3d-MAs-111 EFS: KMA FPV/3e-MAs-111			<b>Course name:</b> State examination (Dissertation Thesis)		
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> IFS, EFS: 0-0-0-0 /week <b>Method of study:</b> combined <b>Form of study:</b> internal, external					
<b>Number of credits:</b> 20					
<b>Recommended semester of study:</b> IFS: 24 months at latest, EFS: 30 months at latest					
<b>Degree of study:</b> 3.					
<b>Prerequisites:</b>					
<b>Course completion conditions:</b> <i>Successful state examination, including the dissertation project defence</i>					
<b>Learning outcomes (performance standard):</b> <i>Students understand the process of writing a dissertation, as well as the chosen problems and methods of solving them. They have partial results or at least their hypotheses supported by examples and counterexamples. Students are able to present their scientific aims and appropriately answer questions asked by their supervisor, reviewer, and the examining board. They are also knowledgeable in their dissertation topic, have in-depth understanding of matters both directly and indirectly linked to their thesis and to the courses in the study part.</i>					
<b>Brief outline of the course:</b> <i>Completion of a dissertation thesis project. Study of links between their thesis and similar topics with the courses in the study part. Presentation of the dissertation thesis project. Answers to the questions and comments by the supervisor and the reader, as well as by the examining board.</i>					
<b>Recommended literature:</b> according to supervisor's recommendations, taking into account the focus of the dissertation thesis					
<b>Language of instruction:</b> Slovak, English					
<b>Course assessment:</b>					
A	B	C	D	E	FX
<b>Notes – student time load:</b> 600 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 550 hours</i>					
<b>Instructor:</b> <i>state examination board</i> <i>instruction: Slovak, English</i>					
<b>Last changed:</b> 28 February, 2022					
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-112 EFS: KMA FPV/3e-MAs-112	<b>Course name:</b> Publication registered in the WoS or Scopus databases (at least in printing queue before the defence)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 35	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Publication registered in the WoS or Scopus databases (at least in printing queue before the dissertation defence – in such cases, journal publication covered by one of the databases is sufficient).</i>	
<b>Learning outcomes (performance standard):</b> <i>Students are able to prove their qualification to publish scientific results on international level. They demonstrate the acquired knowledge and skills when preparing a paper. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Formulating a scientific problem together with the relevant hypotheses, research of literature and the relevant electronic resources. Solving a problem, its modifications, generalization or magnification. Processing of results into a publication (in English, in TEX) Offering the paper for publishing, communication with the editorial board.</i>	
<b>Recommended literature:</b> based on the nature of the mathematical problem; among the following: <ol style="list-style-type: none"> <li>1. J. Trzeciak: Writing mathematical papers in English. A practical guide. Gdańsk Teachers' Press 1993.</li> <li>2. LaTeX Wikibook. <a href="https://en.wikibooks.org/wiki/LWaTeX">https://en.wikibooks.org/wiki/LWaTeX</a></li> <li>3. G. Grätzer: More Math Into LaTeX, 5th ed. Springer 2016.</li> <li>4. S. Kottwitz: LaTeX Beginner's Guide, 2nd ed., Packt Publishing Ltd. 2021.</li> <li>5. E. Ash, L. Scholefield: What's the best journal for my paper? Elsevier Connect Resources. <a href="https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help">https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help</a></li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 1050 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 1000 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> prof. RNDr. Ľubomír Snoha, DSc., DrSc.	

<b>Institution:</b> Matej Bel University in Banská Bystrica					
<b>Faculty:</b> Faculty of Natural Sciences					
<b>Course code:</b> IFS: KMA FPV/3d-MAs-113 EFS: KMA FPV/3e-MAs-113			<b>Course name:</b> State Examination Dissertation Thesis and Defence		
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external					
<b>Number of credits:</b> 40					
<b>Recommended semester of study:</b>					
<b>Degree of study:</b> 3.					
<b>Prerequisites:</b>					
<b>Course completion conditions:</b> <i>Successful defence of a dissertation thesis.</i>					
<b>Learning outcomes (performance standard):</b> <i>Students prove their ability to make a list of their scientific results in a form of a dissertation thesis and present them. They are able to appropriately respond to the readers' and the board's questions. They know what are the possibilities of further research.</i>					
<b>Brief outline of the course:</b> <i>Writing of the dissertation thesis. Presentation of the dissertation thesis. Answering the questions and comments by the supervisor and the reviewer, as well as by the examining board.</i>					
<b>Recommended literature:</b> according to supervisor's recommendations, literature found independently					
<b>Language of instruction:</b> Slovak, English					
<b>Course assessment:</b>					
A	B	C	D	E	FX
<b>Notes – student time load:</b> 1200 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 1150 hours</i>					
<b>Instructor:</b> <i>supervisor, state examination board</i> <i>instruction: Slovak, English</i>					
<b>Last changed:</b> 28 February, 2022					
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>					

## Compulsory optional courses

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-209 EFS: KMA FPV/3e-MAs-209	<b>Course name:</b> Another publication registered in the WoS or Scopus databases (at least in printing queue before the defence)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 35	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Publication (not 3d-MAs-112) registered in WoS or Scopus databases (at least in printing queue before the dissertation defence – in such cases, journal publication covered by one of the databases is sufficient).</i>	
<b>Learning outcomes (performance standard):</b> <i>Students will deepen their qualification to publish scientific results at international level. They demonstrate the acquired knowledge and skills when preparing a paper. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Formulating a scientific problem together with the relevant hypotheses, research of literature and the relevant electronic resources. Solving a problem, its modifications, generalization or magnification. Processing of results into a publication (in English, in TEX) Offering the paper for publishing, communication with the editorial board.</i>	
<b>Recommended literature:</b> based on the nature of the mathematical problem; among the following: <ol style="list-style-type: none"> <li>1. J. Trzeciak: Writing mathematical papers in English. A practical guide. Gdańsk Teachers' Press 1993.</li> <li>2. LaTeX Wikibook. <a href="https://en.wikibooks.org/wiki/LWaTeX">https://en.wikibooks.org/wiki/LWaTeX</a></li> <li>3. G. Grätzer: More Math Into LaTeX, 5th ed. Springer 2016.</li> <li>4. S. Kottwitz: LaTeX Beginner's Guide, 2nd ed., Packt Publishing Ltd. 2021.</li> <li>5. E. Ash, L. Scholefield: What's the best journal for my paper? Elsevier Connect Resources. <a href="https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help">https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help</a></li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 1050 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 1000 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Eubomír Snoha, DSc., DrSc.</i>	
<b>Institution:</b> Matej Bel University in Banská Bystrica	



<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-210 EFS: KMA FPV/3e-MAs-210	<b>Course name:</b> Publication registered in MathSciNet (WoS or Scopus record not necessary)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 15	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Publication (different from 112 and 209) registered in MathSciNet; WoS or Scopus record not necessary.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students prove their qualification to publish scientific results. They demonstrate the acquired knowledge and skills when preparing a paper. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Formulating a scientific problem together with the relevant hypotheses, research of literature and the relevant electronic resources. Solving a problem, its modifications, generalization, or magnification. Processing of results into a publication (in English, in TEX) Offering the paper for publishing, communication with the editorial board.</i>	
<b>Recommended literature:</b> based on the nature of the mathematical problem; among the following: <ol style="list-style-type: none"> <li>1. J. Trzeciak: Writing mathematical papers in English. A practical guide. Gdańsk Teachers' Press 1993.</li> <li>2. LaTeX Wikibook. <a href="https://en.wikibooks.org/wiki/LWTeX">https://en.wikibooks.org/wiki/LWTeX</a></li> <li>3. G. Grätzer: More Math Into LaTeX, 5th ed. Springer 2016.</li> <li>4. S. Kottwitz: LaTeX Beginner's Guide, 2nd ed., Packt Publishing Ltd. 2021.</li> <li>5. E. Ash, L. Scholefield: What's the best journal for my paper? Elsevier Connect Resources. <a href="https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help">https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help</a></li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 450 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 25 hours</i> <i>self-study: 425 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> prof. RNDr. Lubomír Snoha, DSc., DrSc.	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-211 EFS: KMA FPV/3e-MAs-211	<b>Course name:</b> Another publication registered in MathSciNet (WoS or Scopus not necessary)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 15	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Publication (different from 3d- MAs-112, 3d- MAs-209, 3d- MAs-210) registered in MathSciNet database, WoS or Scopus record not necessary.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students will deepen their ability to publish scientific results. They demonstrate the acquired knowledge and skills when preparing a paper. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Formulating a scientific problem together with the relevant hypotheses, research of literature and the relevant electronic resources. Solving a problem, its modifications, generalization or magnification. Processing of results into a publication (in English, in TEX) Offering the paper for publishing, communication with the editorial board.</i>	
<b>Recommended literature:</b> based on the nature of the mathematical problem; among the following: <ol style="list-style-type: none"> <li>1. J. Trzeciak: Writing mathematical papers in English. A practical guide. Gdańsk Teachers' Press 1993.</li> <li>2. LaTeX Wikibook. <a href="https://en.wikibooks.org/wiki/LWaTeX">https://en.wikibooks.org/wiki/LWaTeX</a></li> <li>3. G. Grätzer: More Math Into LaTeX, 5th ed. Springer 2016.</li> <li>4. S. Kottwitz: LaTeX Beginner's Guide, 2nd ed., Packt Publishing Ltd. 2021.</li> <li>5. E. Ash, L. Scholefield: What's the best journal for my paper? Elsevier Connect Resources. <a href="https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help">https://www.elsevier.com/connect/whats-the-best-journal-for-my-paper-new-tool-can-help</a></li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 450 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 25 hours</i> <i>self-study: 425 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> prof. RNDr. Ľubomír Snoha, DSc., DrSc.	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-212 EFS: KMA FPV/3e-MAs-212	<b>Course name:</b> Reference in WoS or Scopus
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 10	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Bibliographic reference registered in WoS or Scopus databases</i>	
<b>Learning outcomes (performance standard):</b> <i>Students know that references in WoS and Scopus are used in Slovakia in assessing the scientific level of universities, individuals, including doctoral candidates. They differentiate between publishing and citing practices in relevant scientific disciplines, linked to the method of comparing scientists from different disciplines based solely on the number of bibliographic references or publications.</i>	
<b>Brief outline of the course:</b> <i>Working with WoS and Scopus databases. Law of the constant ratio.</i>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. I. Podlubny, K. Kassayova: The law of the constant ratio. Notices of the Amer. Math. Soc. 58(2011), no.5, 653-654.</li> <li>2. I. Podlubny, K. Kassayova: Law of the constant ratio. Towards a better list of citation superstars: compiling a multidisciplinary list of highly cited researchers. Research Evaluation 15(2006), no. 3, 154–162.</li> <li>3. I. Podlubny: Comparison of scientific impact expressed by the number of citations in different fields of science. Scientometrics 64(2005), no. 1, 95-99.</li> <li>4. M. Biagioli, A. Lippman (eds.): Gaming the Metrics. Misconduct and manipulation in academic research. MIT Press, 2020.</li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation):</i> <i>self-study:</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-213 EFS: KMA FPV/3e-MAs-213	<b>Course name:</b> Another reference in WoS or Scopus databases
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 10	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Bibliographic reference registered in WoS or Scopus databases (different from 3d- MAs-212).</i>	
<b>Learning outcomes (performance standard):</b> <i>Students know that references in WoS and Scopus are used in Slovakia in assessing the scientific level of universities, individuals, including doctoral candidates. They differentiate between publishing and citing practices in relevant scientific disciplines, linked to the method of comparing scientists from different disciplines based solely on the number of bibliographic references or publications.</i>	
<b>Brief outline of the course:</b> <i>Working with WoS and Scopus databases. Law of the constant ratio.</i>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. I. Podlubny, K. Kassayova: The law of the constant ratio. Notices of the Amer. Math. Soc. 58(2011), no.5, 653-654.</li> <li>2. I. Podlubny, K. Kassayova: Law of the constant ratio. Towards a better list of citation superstars: compiling a multidisciplinary list of highly cited researchers. Research Evaluation 15(2006), no. 3, 154–162.</li> <li>3. I. Podlubny: Comparison of scientific impact expressed by the number of citations in different fields of science. Scientometrics 64(2005), no. 1, 95-99.</li> <li>4. M. Biagioli, A. Lippman (eds.): Gaming the Metrics. Misconduct and manipulation in academic research. MIT Press, 2020.</li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation):</i> <i>self-study:</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-214 EFS: KMA FPV/3e-MAs-214	<b>Course name:</b> Reference (WoS or Scopus record not necessary)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Bibliographic reference (different from 3d- MAs-212 a 3d- MAs-213), WoS or Scopus record not necessary.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students are able to search for references not only in WoS and Scopus, but in other databases as well (e.g. Zentralblatt MATH or Google Scholar). They differentiate between publishing and citing practices in relevant scientific disciplines, linked to the method of comparing scientists from different disciplines based solely on the number of bibliographic references or publications.</i>	
<b>Brief outline of the course:</b> <i>Working with Zentralblatt MATH and Google Scholar. Law of the constant ratio.</i>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. I. Podlubny, K. Kassayova: The law of the constant ratio. Notices of the Amer. Math. Soc. 58(2011), no.5, 653-654.</li> <li>2. I. Podlubny, K. Kassayova: Law of the constant ratio. Towards a better list of citation superstars: compiling a multidisciplinary list of highly cited researchers. Research Evaluation 15(2006), no. 3, 154–162.</li> <li>3. I. Podlubny: Comparison of scientific impact expressed by the number of citations in different fields of science. Scientometrics 64(2005), no. 1, 95-99.</li> <li>4. M. Biagioli, A. Lippman (eds.): Gaming the Metrics. Misconduct and manipulation in academic research. MIT Press, 2020.</li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation):</i> <i>self-study:</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-215 EFS: KMA FPV/3e-MAs-215	<b>Course name:</b> Another reference (WoS or Scopus record not necessary)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> Another reference, not necessarily registered in WoS or Scopus (different from 3d- MAs-212, 3d- MAs-213, 3d- MAs-214)	
<b>Learning outcomes (performance standard):</b> <i>Students are able to search for references not only in WoS and Scopus, but in other databases as well (e.g. Zentralblatt MATH or Google Scholar). They differentiate between publishing and citing practices in relevant scientific disciplines, linked to the method of comparing scientists from different disciplines based solely on the number of bibliographic references or publications.</i>	
<b>Brief outline of the course:</b> <i>Working with Zentralblatt MATH and Google Scholar. Law of the constant ratio.</i>	
<b>Recommended literature:</b> <ol style="list-style-type: none"> <li>1. I. Podlubny, K. Kassayova: The law of the constant ratio. Notices of the Amer. Math. Soc. 58(2011), no.5, 653-654.</li> <li>2. I. Podlubny, K. Kassayova: Law of the constant ratio. Towards a better list of citation superstars: compiling a multidisciplinary list of highly cited researchers. Research Evaluation 15(2006), no. 3, 154–162.</li> <li>3. I. Podlubny: Comparison of scientific impact expressed by the number of citations in different fields of science. Scientometrics 64(2005), no. 1, 95-99.</li> <li>4. M. Biagioli, A. Lippman (eds.): Gaming the Metrics. Misconduct and manipulation in academic research. MIT Press, 2020.</li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation):</i> <i>self-study:</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-216 EFS: KMA FPV/3e-MAs-216	<b>Course name:</b> Active participation in a scientific conference with international participation
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 10	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Active participation in a scientific conference with international participation in a form of presentation of results.</i>	
<b>Learning outcomes (performance standard):</b> <i>They prove their qualification to present scientific results on international level. They demonstrate the acquired knowledge and skills during preparation of the presentation. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Preparation of a presentation, usually in a form of a lecture or a scientific essay. Presentation at a conference. Answering questions and comments by the audience.</i>	
<b>Recommended literature:</b> based on the nature of presentation, among the following: <ol style="list-style-type: none"> <li>1. G. Grätzer: Practical LaTeX. Springer 2014</li> <li>2. G. Grätzer: More Math Into LaTeX, 5th Edition. Springer 2016</li> <li>3. S. Krantz: How to Teach Mathematics, 3rd Edition. American Mathematical Society 2015</li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 300 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 30 hours</i> <i>self-study: 270 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-217 EFS: KMA FPV/3e-MAs-217	<b>Course name:</b> Active participation in another scientific conference with international participation
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 10	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Active participation in a scientific conference with international participation in a form of presentation of results.</i>	
<b>Learning outcomes (performance standard):</b> <i>They prove their qualification to present scientific results on international level. They demonstrate the acquired knowledge and skills during preparation of the presentation. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Preparation of a presentation, usually in a form of a lecture or a scientific essay. Presentation at a conference. Answering questions and comments by the audience.</i>	
<b>Recommended literature:</b> based on the nature of presentation, among the following: <ol style="list-style-type: none"> <li>1. G. Grätzer: Practical LaTeX. Springer 2014</li> <li>2. G. Grätzer: More Math Into LaTeX, 5th Edition. Springer 2016</li> <li>3. S. Krantz: How to Teach Mathematics, 3rd Edition. American Mathematical Society 2015</li> </ol>	
<b>Language of instruction:</b> English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 300 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 30 hours</i> <i>self-study: 270 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	



<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-218 EFS: KMA FPV/3e-MAs-218	<b>Course name:</b> Active participation in a scientific conference (international participation not required)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Active participation in a scientific conference in a form of presentation of results.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students prove their qualification to present scientific results. They demonstrate the acquired knowledge and skills during preparation of the presentation. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Preparation of a presentation, usually in a form of a lecture or a scientific essay. Presentation at a conference. Answering questions and comments by the audience.</i>	
<b>Recommended literature:</b> based on the nature of presentation, among the following: <ol style="list-style-type: none"> <li>1. G. Grätzer: Practical LaTeX. Springer 2014</li> <li>2. G. Grätzer: More Math Into LaTeX, 5th Edition. Springer 2016</li> <li>3. S. Krantz: How to Teach Mathematics, 3rd Edition. American Mathematical Society 2015</li> </ol>	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 20 hours</i> <i>self-study: 130 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-219 EFS: KMA FPV/3e-MAs-219	<b>Course name:</b> Active participation in another scientific conference (international participation not required)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> C <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Active participation in a scientific conference in a form of presentation of results.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students prove their qualification to present scientific results. They demonstrate the acquired knowledge and skills during preparation of the presentation. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Preparation of a presentation, usually in a form of a lecture or a scientific essay. Presentation at a conference. Answering questions and comments by the audience.</i>	
<b>Recommended literature:</b> based on the nature of presentation, among the following: <ol style="list-style-type: none"> <li>1. G. Grätzer: Practical LaTeX. Springer 2014</li> <li>2. G. Grätzer: More Math Into LaTeX, 5th Edition. Springer 2016</li> <li>3. S. Krantz: How to Teach Mathematics, 3rd Edition. American Mathematical Society 2015</li> </ol>	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 20 hours</i> <i>self-study: 130 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-220 EFS: KMA FPV/3e-MAs-220	<b>Course name:</b> Invite for a presentation at a scientific seminar outside of MBU (with the exception of 3d-MAs-103 up to 3d-MAs-110)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Giving a lecture on a scientific seminar outside of MBU (not 3d-MAs-103 up to 3d-MAs-110).</i>	
<b>Learning outcomes (performance standard):</b> <i>Students prove their qualification to present scientific results. They demonstrate the acquired knowledge and skills when preparing the presentation. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Lecture preparation. Giving a lecture on a scientific seminar. Answering questions and comments by the audience.</i>	
<b>Recommended literature:</b> based on the nature of presentation, among the following: 1. G. Grätzer: Practical LaTeX. Springer 2014 2. G. Grätzer: More Math Into LaTeX, 5th Edition. Springer 2016 3. S. Krantz: How to Teach Mathematics, 3rd Edition. American Mathematical Society 2015	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 20 hours</i> <i>self-study: 130 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-221 EFS: KMA FPV/3e-MAs-221	<b>Course name:</b> Another invite for a presentation at a scientific seminar outside of MBU (with the exception of 3d-MAs-103 up to 3d-MAs-110)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> <b>Method of study:</b> <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Giving a lecture on a scientific seminar outside of MBU (not 3d-MAs-103 up to 3d-MAs-110).</i>	
<b>Learning outcomes (performance standard):</b> <i>Students prove their qualification to present scientific results. They demonstrate the acquired knowledge and skills when preparing the presentation. They obtain the skills to communicate with the academic community and disseminate scientific results efficiently.</i>	
<b>Brief outline of the course:</b> <i>Lecture preparation. Giving a lecture on a scientific seminar. Answering questions and comments by the audience.</i>	
<b>Recommended literature:</b> based on the nature of presentation, among the following: <ol style="list-style-type: none"> <li>1. G. Grätzer: Practical LaTeX. Springer 2014</li> <li>2. G. Grätzer: More Math Into LaTeX, 5th Edition. Springer 2016</li> <li>3. S. Krantz: How to Teach Mathematics, 3rd Edition. American Mathematical Society 2015</li> </ol>	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
completed	not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 20 hours</i> <i>self-study: 130 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-222 EFS: KMA FPV/3e-MAs-222	<b>Course name:</b> Completion of a summer/winter school for doctoral candidates
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> IFS, EFS: <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> any	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Completion of a summer/winter school for doctoral candidates.</i> <i>The assessment of the course is in accordance with the grading scale set by the MBU Academic Policies and Procedures.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students completed a summer/winter school by presenting their research results from their paper. They acquired contacts domestic and foreign contacts in their research area. They actively participated in the discussions at a summer/winter school. They published the abstract according to the set criteria, along with extended abstract or research work in the event anthology.</i>	
<b>Brief outline of the course:</b> <i>Choosing a summer/winter school in cooperation with the supervisor. Preparation of the paper and a presentation. Active presentation of personal research at the summer/winter school.</i>	
<b>Recommended literature:</b> <i>Based on the dissertation thesis topic and the focus of the event.</i>	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
Completed	Not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 100 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak Language</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-223 EFS: KMA FPV/3e-MAs-223	<b>Course name:</b> Completion of another summer/winter school for doctoral candidates
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> IFS, EFS: <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> any	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Completion of a summer/winter school for doctoral candidates.</i> <i>The assessment of the course is in accordance with the grading scale set by the MBU Academic Policies and Procedures.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students completed a summer/winter school by presenting their research results from their paper. They acquired contacts domestic and foreign contacts in their research area. They actively participated in the discussions at a summer/winter school. They published the abstract according to the set criteria, along with extended abstract or research work in the event anthology.</i>	
<b>Brief outline of the course:</b> <i>Choosing a summer/winter school in cooperation with the supervisor. Preparation of the paper and a presentation. Active presentation of personal research at the summer/winter school.</i>	
<b>Recommended literature:</b> <i>Based on the dissertation thesis topic and the focus of the event.</i>	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
Completed	Not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 100 hours</i>	
<b>Instructor:</b> <i>supervisor</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-224 EFS: KMA FPV/3e-MAs-224	<b>Course name:</b> Participation in a research grant project in the first year (researcher)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> IFS, EFS: <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Students participate in a research grant project as members of a research team.</i> <i>The assessment of the course is in accordance with the grading scale set by the MBU Academic Policies and Procedures.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students focus on a partial task within a research grant project, under leadership of their supervisor. They present their results at the department seminars, at summer/winter schools as well as at scientific events. They participate actively in the administrative tasks related to project documentation.</i>	
<b>Brief outline of the course:</b> <i>Research work under leadership of the supervisor which is related to the dissertation thesis and to the scope of the research grant project.</i>	
<b>Recommended literature:</b> Based on the dissertation thesis topic and the scope of the research grant project.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
Completed	Not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 100 hours</i>	
<b>Instructor:</b> <i>lectures/consultation/seminars:</i> <i>supervisor, project leader</i> <i>instruction: Slovak Language</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-225 EFS: KMA FPV/3e-MAs-225	<b>Course name:</b> Participation in a research grant project in the second year (researcher)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> IFS, EFS: <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Students become members of a research team, set up for the research grant project, in the second year of their studies.</i> <i>The assessment of the course is in accordance with the grading scale set by the MBU Academic Policies and Procedures.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students focus on a partial task within a research grant project, under leadership of their supervisor. They present their results at the department seminars, at summer/winter schools as well as at scientific events. They participate actively in the administrative tasks related to project documentation.</i>	
<b>Brief outline of the course:</b> <i>Research work under leadership of the supervisor which is related to the dissertation thesis and to the scope of the research grant project.</i>	
<b>Recommended literature:</b> Based on the dissertation thesis topic and the scope of the research grant project.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
Completed	Not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 100 hours</i>	
<b>Instructor:</b> <i>lectures/consultation/seminars:</i> <i>supervisor, project leader</i> <i>instruction: Slovak Language</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	



<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-226 EFS: KMA FPV/3e-MAs-226	<b>Course name:</b> Participation in a research grant project in the third year (researcher)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> IFS, EFS: <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> 3.	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Students become members of a research team, set up for the research grant project, in the third year of their studies.</i> <i>The assessment of the course is in accordance with the grading scale set by the MBU Academic Policies and Procedures.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students focus on a partial task within a research grant project, under leadership of their supervisor. They present their results at the department seminars, at summer/winter schools as well as at scientific events. They participate actively in the administrative tasks related to project documentation.</i>	
<b>Brief outline of the course:</b> <i>Research work under leadership of the supervisor which is related to the dissertation thesis and to the scope of the research grant project.</i>	
<b>Recommended literature:</b> Based on the dissertation thesis topic and the scope of the research grant project.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
Completed	Not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 100 hours</i>	
<b>Instructor:</b> <i>lectures/consultation/seminars:</i> <i>supervisor, project leader</i> <i>instruction: Slovak Language</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc., DrSc.</i>	

<b>Institution:</b> Matej Bel University in Banská Bystrica	
<b>Faculty:</b> Faculty of Natural Sciences	
<b>Course code:</b> IFS: KMA FPV/3d-MAs-227 EFS: KMA FPV/3e-MAs-227	<b>Course name:</b> Another scientific seminar (at least 1 semester, with the exception of 3d-MAs-103 up to 3d-MAs-110)
<b>Type, load and method of educational activities:</b> <b>Course type (compulsory, elective, voluntary):</b> E <b>Recommended course load L-S-C/LW:</b> IFS, EFS: <b>Method of study:</b> combined <b>Form of study:</b> internal, external	
<b>Number of credits:</b> 5	
<b>Recommended semester of study:</b> IFS, EFS: any semester	
<b>Degree of study:</b> Doctoral level	
<b>Prerequisites:</b>	
<b>Course completion conditions:</b> <i>Active participation in a scientific seminar.</i>	
<b>Learning outcomes (performance standard):</b> <i>Students attend a scientific seminar according to the recommendations of their supervisor. They are required to present the results of their research at minimum once a semester.</i>	
<b>Brief outline of the course:</b> <i>Active participation in a scientific seminar under leadership of the supervisor.</i>	
<b>Recommended literature:</b> Based on the dissertation thesis topic and the focus of the scientific seminar.	
<b>Language of instruction:</b> Slovak, English	
<b>Course assessment:</b>	
Completed	Not completed
<b>Notes – student time load:</b> 150 hours <b>IFS/EFS</b> <i>combined study (L, S, C/LW, consultation): 50 hours</i> <i>self-study: 100 hours</i>	
<b>Instructor:</b> <i>lectures/consultation/seminars:</i> <i>supervisor, seminar instructor.</i> <i>instruction: Slovak, English</i>	
<b>Last changed:</b> 28 February, 2022	
<b>Approved by:</b> <i>prof. RNDr. Ľubomír Snoha, DSc. DrSc.</i>	