

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:		Izbrana poglavja iz finančne matematike 1				
Course title:		Topics in financial mathematics 1				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Magistrski študijski program Matematika		ni smeri		1 ali 2	prvi ali drugi	
Master's study programme Mathematics		none		1 or 2	first or second	
Vrsta predmeta / Course type				izbirni		
Univerzitetna koda predmeta / University course code:				M2522		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	15	30			105	6
Nosilec predmeta / Lecturer:		prof. Tomaž Košir				
Jeziki / Languages:		Predavanja / Lectures:		slovenski/Slovene, angleški/English		
		Vaje / Tutorial:		slovenski/Slovene, angleški/English		
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vsebina:				Content (Syllabus outline):		
Predavatelj izbira med naslednjimi pa tudi drugimi aktualnimi področji finančne matematike:				Lecturer can choose among the following and some other current topics in financial mathematics: Credit risk models: basic definitions, basic		

<p>Modeli za kreditno tveganje: osnovne definicije, osnovni modeli, vrednotenje izvedenih vrednostnih papirjev vezanih na kreditno tveganje.</p> <p>Upravljanje s tveganjem: mere tveganja, koherenca, dinamične mere tveganja, modeli s kopulami, teorija ekstremnih vrednosti, optimalne strategije, modeli za obvladovanje tveganja.</p>	<p>models, pricing of credit derivatives.</p> <p>Risk management: risk measures, coherence, dynamic risk measures, copula models, extreme value theory, optimal strategies, risk management models.</p>
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Temeljni literatura in viri / Readings:

<p>M. Ammann: Credit Risk Valuation : Methods, Models and Applications, 2nd edition, Springer, Berlin, 2001.</p> <p>J. Grandell: Aspects of Risk Theory, Springer, New York, 1992.</p> <p>I. Karatzas, S. E. Shreve: Methods of Mathematical Finance, Springer, New York, 2001.</p> <p>T. Björk: Arbitrage Theory in Continuous Time, 2nd edition, Oxford Univ. Press, Oxford, 2004.</p> <p>P. Wilmott: Derivatives : The Theory and Practice of Financial Engineering, Wiley, New York, 2000.</p> <p>A. J. McNeil, R. Frey, P. Embrechts, Paul: Quantitative risk management: Concepts, techniques and tools, Princeton Series in Finance, Princeton University Press, Princeton, NJ, 2005.</p> <p>P. Embrechts, C. Klüppelberg, T. Mikosch: Modelling extremal events for insurance and finance, Springer-Verlag, Berlin, 1997.</p>

Cilji in kompetence:

<p>Predmet pokriva poglavja iz matematičnih financ, pri katerih se prepleta ekonomsko razmišljanje z zapletenimi matematičnimi orodji. Nekatera poglavja so nadgradnja prejšnjih z dodatnimi interpretacijami, nekatera pa so pomemben del razmišljanja o tveganju.</p> <p>Zaradi nepostredne uporabnosti vsebin bodo pri predmetu sodelovali tudi strokovnjaki iz prakse.</p>
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Objectives and competences:

<p>The course covers topics in mathematical finance in which economic reasoning is combined with advanced mathematical tools. Some of them are based on previous courses and give additional interpretation, some contribute to understanding of the risks.</p> <p>Since the content is of great practical importance we expect that also specialists from financial practice will present their work experience during the course.</p>

Predvideni študijski rezultati:

Intended learning outcomes:

<p>Znanje in razumevanje: Razumevanje matematičnih modelov, ki se uporabljajo v matematičnih financah in sredstev za njihovo obravnavo.</p> <p>Uporaba:</p> <p>Pridobljeno znanje je po eni strani neposredno prenosljivo, po drugi strani pa je izhodišče za kobiniranje matematičnega znanja z ekonomskimi vsebinami.</p> <p>Refleksija:</p> <p>Področje, in s tem posledično predmet, združuje številne znanja iz matematike od linearna algebre do parcialnih diferencialnih enačb.</p> <p>Prenosljive spretnosti – niso vezane le na en predmet:</p> <p>Pridobljeno znanje je neposredno uporabno v finančnih ustanovah kot so banke in zavarovalnice. Vsebina predmeta tudi pomaga izostritvi sposobnosti matematičnega modeliranja.</p>	<p>Knowledge and understanding: Understanding of mathematical models used in mathematical finance and the mathematical tools used in solutions.</p> <p>Application:</p> <p>The knowledge and skills acquired are directly transferable and can also serve for combining mathematical reasoning with economic topics.</p> <p>Reflection:</p> <p>The subject of the course, hence the course itself, combines numerous mathematical skills starting from linear algebra to partial differential equations.</p> <p>Transferable skills:</p> <p>The knowledge and skills acquired are immediately applicable in financial institutions such as banks and insurance companies. The content also serves to deepen the ability to use mathematical models.</p>
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Metode poučevanja in učenja:

predavanja, vaje, konzultacije, seminarske naloge

Learning and teaching methods:

Lectures, exercises, consultations, seminars

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):	50%	Type (examination, oral, coursework, project):
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<p>samostojna seminarska naloga</p> <p>opravljena seminarska naloga za pristop k teoretičnemu delu izpita</p> <p>Ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)</p>	<p>50%</p>	<p>individual seminar</p> <p>completed seminar work is required for the exam on the course content</p> <p>Grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)</p>
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Reference nosilca / Lecturer's references:

Tomaž Košir:

- BERNIK, Janez, DRNOVŠEK, Roman, KOŠIR, Tomaž, LIVSHITS, Leo, MASTNAK, Mitja, OMLADIČ, Matjaž, RADJAVI, Heydar. Approximate permutability of traces on semigroups of matrices. Operators and matrices, ISSN 1846-3886, 2007, vol. 1, no. 4, str. 455-467 [COBISS.SI-ID 14492761]
- KOŠIR, Tomaž, OBLAK, Polona. On pairs of commuting nilpotent matrices. Transformation groups, ISSN 1083-4362, 2009, vol. 14, no. 1, str. 175-182 [COBISS.SI-ID 15077977]
- BERNIK, Janez, DRNOVŠEK, Roman, KOKOL-BUKOVŠEK, Damjana, KOŠIR, Tomaž, OMLADIČ, Matjaž, RADJAVI, Heydar. On semitransitive jordan algebras of matrices. Journal of algebra and its applications, ISSN 0219-4988, 2011, vol. 10, iss. 2, str. 319-333 [COBISS.SI-ID 15908697]