

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
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 / elective		
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. dr. 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:			
Vpis v letnik študija.			Enrolment in the programme.			
Vsebina:			Content (Syllabus outline):			

<p>Predavatelj izbira med naslednjimi pa tudi drugimi aktualnimi področji finančne matematike:</p> <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>Lecturer can choose among the following and some other current topics in financial mathematics:</p> <p>Credit risk models: basic definitions, basic 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:

M. Ammann: Credit Risk Valuation : Methods, Models and Applications, 2nd edition, Springer, Berlin, 2001.

J. Grandell: Aspects of Risk Theory, Springer, New York, 1992.

I. Karatzas, S. E. Shreve: Methods of Mathematical Finance, Springer, New York, 2001.

T. Björk: Arbitrage Theory in Continuous Time, 2nd edition, Oxford Univ. Press, Oxford, 2004.

P. Wilmott: Derivatives : The Theory and Practice of Financial Engineering, Wiley, New York, 2000.

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. Embrechts, C. Klüppelberg, T. Mikosch: Modelling extremal events for insurance and finance, Springer-Verlag, Berlin, 1997.

Cilji in kompetence:

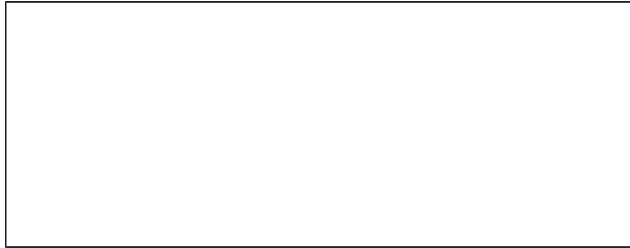
Predmet pokriva poglavja iz matematičnih financ, pri katerih se prepleta ekonomsko razmišljanje z zapletenimi matematičnimi orodji. Nekatera poglavja so nadgradnja prejšnjih z dodatnimi interpretacijami, nekatera pa so pomemben del razmišljanja o tveganju. Zaradi nepostredne uporabnosti vsebin bodo pri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

Objectives and competences:

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.

Since the content is of great practical



importance we expect that also specialists from financial practice will present their work experience during the course.

Predvideni študijski rezultati:

Znanje in razumevanje:

Razumevanje matematičnih modelov, ki se uporabljajo v matematičnih finančnih sredstvih za njihovo obravnavo.

Uporaba:

Pridobljeno znanje je po eni strani neposredno prenosljivo, po drugi strani pa je izhodišče za kombiniranje matematičnega znanja z ekonomskimi vsebinami.

Refleksija:

Področje, in s tem posledično predmet, združuje številne znanja iz matematike od linearna algebre do parcialnih diferencialnih enačb.

Prenosljive spretnosti – niso vezane le na en predmet:

Pridobljeno znanje je neposredno uporabno v finančnih ustanovah kot so banke in zavarovalnice. Vsebina predmeta tudi pomaga izostriti sposobnosti matematičnega modeliranja.

Intended learning outcomes:

Knowledge and understanding:

Understanding of mathematical models used in mathematical finance and the mathematical tools used in solutions.

Application:

The knowledge and skills acquired are directly transferable and can also serve for combining mathematical reasoning with economic topics.

Reflection:

The subject of the course, hence the course itself, combines numerous mathematical skills starting from linear algebra to partial differential equations.

Transferable skills:

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.

Metode poučevanja in učenja:

Learning and teaching methods:

predavanja, vaje, konzultacije, seminarske naloge	Lectures, exercises, consultations, seminars
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Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

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

Reference nosilca / Lecturer's references:

Tomaž Košir:

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]

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, 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]