UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Temelji finančnega inženiringa
Course title:	Foundations of financial engineering

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna matematika – enopredmetna, 2. stopnja		2	3
Educational mathematics single-major, 2nd cycle		2	3

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45		30			105	6

Nosilec predmeta / Lecturer: Miklavž MASTINŠEK

Jeziki / Languages:	Predavanja / Lectures:	SLOVENSKO/SLOVENE
	Vaje / Tutorial:	SLOVENSKO/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisits:

Vsebina:	Content (Syllabus outline):
1. Matematične osnove 2. Izvedeni finančni instrumenti 3. Tveganje in varnost 4. Opcije 5. Vrednotenje opcij, hedging 6. Binomski model 7. Black-Scholesov 8. Delta, gamma, sigma 9. Monte-Carlo metoda	1. Mathematical tools 2. Financial derivatives 3. Risk and security 4. Options 5. Option valuation, hedging 6. Binomial model 7. Black-Scholes model 8. The greeks 9. Monte-Carlo method

Temeljni literatura in viri / Readings:

1. Shreve S. E, Stochastic Calculus for Finance I, The Binomial Asset Pricing Model, Springer, New York, 2004.
2. Shreve S. E, Stochastic Calculus for Finance II, Continuous-Time Models, Springer, New York, 2004.
3. Hull J., Options, Futures and other Derivatives, 11th edition, Pearson Education Limited, Harlow, 2022.
4. Wilmott P., Paul Wilmott Introduces Quantitative Finance, John Wiley & Sons, Chichester, 2007.

Cilji in kompetence:

Namen predmeta je posredovati temeljna teoretična in praktična znanja potrebna pri kvantitativnem in kvalitativnem obravnavanju nalog in procesov s področja finančnega inženiringa. Prav tako je namen predmeta dati osnovo za spremljanje sodobne literature in nadaljnje strokovno izpopolnjevanje.

Objectives and competences:

The objective is to provide fundamental theoretical knowledge and practical skills of financial engineering.
The objective is also to enable the students for additional learning and individual study of new methods.

Predvideni študijski rezultati:

Študent pojasni temeljne vsebine in orodja potrebna za strokovno in korektno vodenje poslov s področja finančnega inženiringa.

Prenesljive/ključne spretnosti in drugi atributi:
Sposobnost samostojnega praktičnega in teoretičnega dela. Zmožnost nadaljnega študija novih kvantitativnih metod finančnega inženiringa.

Intended learning outcomes:

Student clearly explains fundamental theoretical results and tools needed for practicing financial engineering

Transferable/Key Skills and other attributes:
Capabilitiy of understanding and application of knowledge in praxis. Ability of additional learning and individual study of new methods.

Metode poučevanja in učenja:

Predavanja, tehnične demonstracije, aktivne vaje, seminarske vaje

Learning and teaching methods:

Written examination
Seminary work

Načini ocenjevanja:

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
Pisni izpit	80%	Written exam
seminarska naloga	20%	Seminar

Reference nosilca / Lecturer's references:

1. MASTINŠEK, Miklavž. Charm-adjusted delta and delta gamma hedging. *J. deriv.*, 2012, vol. 19, no. 3, str. 69-76, doi: 10.3905/jod.2012.19.3.069. [COBISS.SI-ID 10970908]

2. MASTINŠEK, Miklavž. Financial derivatives trading and delta hedging = Trgovanje z izvedenimi finančnimi instrumenti ter delta hedging. *Naše gospod.*, 2011, letn. 57, št. 3/4, str. 10-15. [COBISS.SI-ID 10733084]

3. MASTINŠEK, Miklavž. Descrete-time delta hedging and the Black-Scholes model with transaction costs. *Math. methods oper. res. (Heidelb.).* [Print ed.], 2006, vol. 64, iss. 2, str. [227]-236, doi: 10.1007/s00186-006-0086-0. [COBISS.SI-ID 8939292]

4. MASTINŠEK, Miklavž. Identifiability for a partial functional differential equation. *Acta sci. math. (Szeged)*, 2003, vol. 69, str. 121-130. [COBISS.SI-ID 7029276]

5. MASTINŠEK, Miklavž. Norm continuity for a functional differential equation with fractional power. *International journal of pure and applied mathematics*, 2003, vol. 5, no. 1, str. 49-56. [COBISS.SI-ID 6783772]