



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Finančna matematika
Course title:	Financial mathematics

Študijski program in stopnja Studyprogrammeandlevel	Študijska smer Studyfield	Letnik Academic year	Semester Semester
Izobraževalna matematika – dvpredmetni, 1. stopnja		2. ali 3.	4.,5. ali 6.
Educational mathematics – Double-major, 1 st degree		2. or 3.	4.,5. or 6.

Vrsta predmeta / Course type

Univerzitetna koda predmeta / Universitycoursecode:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
15		15			150	6

Nosilec predmeta / Lecturer:

Jeziki / Languages:	Predavanja / Lectures:	slovenski / Slovenian
	Vaje / Tutorial:	slovenski / Slovenian

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

Prerequisites:

Vsebina: Finančna matematika: Temeljni računi Teorija obrestnih mer Nominalna in efektivna obrestna mera Intenziteta obrestovanja Zvezno obrestovanje Ocenjevanje investicijskih projektov Rente in posojila	Content (Syllabusoutline): Financial mathematics: Foundations Theory of interest rates Nominal and effective rates of interest The force of interest Continuous compounding Valuing cash flows Annuities and loans Varying annuities Financial instruments
---	---

Spremenljive in zvezne rente
Finančni instrumenti

Aktuarska matematika:
Verjetnost v aktuarstvu
Življenske tablice
Zavarovanje za doživetje
Mešano zavarovanje
Enkratne in večkratne premije
Življenske rente
Komutacijska števila
Matematična rezerva

Actuarial mathematics:
Probability models
Life tables
Life insurance
Endowment insurance
Net premiums
Life annuities
Commutational functions
Mathematical reserves

Temeljni literatura in viri / Readings:

1. McCutcheon J.J. and Scott W.F., An Introduction to the Mathematics of Finance, Edinburgh, 1985.
2. Gerber H.U..1996. Matematika življenskih zavarovanj. DMFA Ljubljana, Zavarovalnica Triglav.
3. Bowers N.L., Gerber H.U., Hickman J.C., Jones D.A., Nesbitt C.J.: 1986. Actuarial Mathematics. Itasca, USA..
4. Gerber H.U..1996. Life Insurance Mathematics. Springer. Berlin, New York.

Cilji in kompetence:

Namen predmeta je posredovati temeljna teoretična in praktična znanja potrebna pri kvantitativnem in kvalitativnem obravnavanju nalog in procesov s področja finančne in aktuarske matematike. 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 and actuarial mathematics. The objective is also to enable the students for additional learning and individual study of new methods

Predvideni študijski rezultati:

Poglobljeno znanje in razumevanje temeljnih vsebin in orodij potrebnih za strokovno korektno vodenje poslov s področja finančne matematike in aktuarskega dela.

Sposobnost samostojnega praktičnega in teoretičnega dela. Zmožnost nadaljnega študija.

Intended learning outcomes:

Knowledge and Understanding:
Fundamental theoretical knowledge and practical skills of financial mathematics and actuarial work.

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

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja, tehnične demonstracije,
aktivne vaje, seminarska naloga

Lectures, technical demonstration,
active work, seminary work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
<u>Sprotno preverjanje:</u> Seminarska naloga (finančni del)	10%	<u>Mid-term testing:</u> Seminary work (financial part)
<u>Izpit:</u> Pisni izpit – problemi (finančni del)	45%	<u>Exams:</u> Written exam – problems (financial part)
Pisni izpit – problemi (aktuarski del)	30%	Written exam – problems (actuarial part)
Pisni izpit – teorija (aktuarski del)	15%	Written exam – theory (actuarial part)
Opravljene sprotne obveznosti so pogoji za pristop k pisnemu izpitu – problemi in teorija.		Passing grades of all mid-term testings are required for taking the written exam – problems and theory.
Pisni izpit – problemi in teorija se lahko nadomesti s tremi delnimi testi (sprotne obveznosti).		Written exam – problems and theory can be replaced with three mid-term tests.

Reference nosilca / Lecturer's references:

1. MASTINŠEK, Miklavž. Charm-adjusted delta and delta gamma hedging. *The Journal of derivatives*, ISSN 1074-1240, 2012, vol. 19, no. 3, str. 69-76, doi: [10.3905/jod.2012.19.3.069](https://doi.org/10.3905/jod.2012.19.3.069). [COBISS.SI-ID [10970908](https://www.cobiss.si/id/10970908)]
2. MASTINŠEK, Miklavž. Financial derivatives trading and delta hedging = Trgovanje z izvedenimi finančnimi instrumenti ter delta hedging. *Naše gospodarstvo*, ISSN 0547-3101, 2011, letn. 57, št. 3/4, str. 10-15. [COBISS.SI-ID [10733084](https://www.cobiss.si/id/10733084)]
3. MASTINŠEK, Miklavž. Discrete-time delta hedging and the Black-Scholes model with transaction costs. *Mathematical methods of operations research*, ISSN 1432-2994. [Print ed.], 2006, vol. 64, iss. 2, str. [227]-236, doi: [10.1007/s00186-006-0086-0](https://doi.org/10.1007/s00186-006-0086-0). [COBISS.SI-ID [8939292](https://www.cobiss.si/id/8939292)]
4. MASTINŠEK, Miklavž. Identifiability for a partial functional differential equation. *Acta scientiarum mathematicarum*, ISSN 0001-6969, 2003, vol. 69, str. 121-130. [COBISS.SI-ID [7029276](https://www.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](https://www.cobiss.si/id/6783772)]