

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:		Matematika v industriji				
Course title:		Mathematics in industry				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Magistrski študijski program Finančna matematika		ni smeri		1 ali 2	prvi ali drugi	
Master's study programme Financial Mathematics		none		1 or 2	first or second	
Vrsta predmeta / Course type				izbirni		
Univerzitetna koda predmeta / University course code:				M2120		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
	30				180	6
Nosilec predmeta / Lecturer:		doc. George Mejak				
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):		

<p>Identifikacija nalog iz realnega sveta.</p> <p>Matematično modeliranje.</p> <p>Numerične metode.</p> <p>Primerjava modelne rešitve z nalogo iz realnega sveta.</p> <p>Pisanje poročila.</p>	<p>Identification real world problems.</p> <p>Mathematical modeling.</p> <p>Numerical methods.</p> <p>Comparison between a model solution and real problem.</p> <p>Report writing.</p>
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Temeljni literatura in viri / Readings:

<p>E. Zakrajšek: Matematično modeliranje, DMFA-založništvo, Ljubljana, 2004.</p> <p>Capasso, Mathematics in Industry, Book series: Mathematics in Industry, Springer.</p> <p>C. Dym, Principles of Mathematical Modeling, Academic Press, 2004.</p> <p>S. Howison: Practical Applied Mathematics: Modelling, Analysis, Approximation, Cambridge Univ. Press, Cambridge, 2005.</p> <p>M. S. Klamkin: Mathematical Modelling : Classroom Notes in Applied Mathematics, SIAM, Philadelphia, 1987.</p>
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Cilji in kompetence:

<p>Cilj predmeta je razviti sposobnosti sodelovanja matematika z nematematiki pri reševanju problemov iz realnega sveta.</p> <p>Kompetence so: razvijanje sposobnosti komuniciranja s potencialnimi uporabniki matematičnih znanj, razvijanje sposobnosti skupinskega dela, sposobnost nadgrajevanja šolskih modelov, spretnost uporabe programskih orodij, z eno besedo, vzgoja industrijskih matematikov za potrebe trga dela.</p>
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Objectives and competences:

<p>The aim of the course is to foster collaboration between mathematicians and non-mathematicians by solving problems from real world. The competences are: to promote communication with possible users of mathematical methods, to promote team work, to extend academic examples to a real world problems, to acquire some knowledge of mathematical software, summarizing, to educate Industrial Mathematicians to meet the growing demand for such experts.</p>
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Predvideni študijski rezultati:

<p>Znanje in razumevanje:</p> <p>Sposobnost komuniciranja z uporabniki matematičnih znanj, sposobnost formuliranja problemov, razumevanje matematičnega modeliranja.</p>
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Intended learning outcomes:

<p>Knowledge and understanding:</p> <p>Knowledge how to communicate with users of mathematical methods, ability to rationally formulate problems, knowledge of mathematical modeling.</p>

<p>Uporaba:</p> <p>Reševanje problemov iz realnega sveta. Povezava z uporabniki matematičnih znanj.</p> <p>Refleksija:</p> <p>Refleksija lastnega razumevanja pridobljenih matematičnih znanj na problemih iz prakse, kritično ovrednotenje skladnosti med teoretičnimi načeli in dejanskim stanjem v praksi.</p> <p>Prenosljive spretnosti – niso vezane le na en predmet: Spretnost uporabe virov znanja, zbiranja in interpretacije podatkov, sodelovanja s strokovnjaki iz drugih področij, skupinsko delo, poročanje o rezultatih dela, pisanje poročil.</p>	<p>Application:</p> <p>Solving real word problems. Cross breeding with users of mathematical methods.</p> <p>Reflection:</p> <p>Reflection of own understanding of mathematical knowledge by solving problems from a real world. Critical assesment of differences between theoretical and practical principles.</p> <p>Transferable skills:</p> <p>How to use knowledge bases, how to collect and interpret data, collaboration with experts from different areas, team work, how to present results, how to write reports.</p>
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Metode poučevanja in učenja:

<p>Projektno delo, delo na terenu, individualen študij, seminarji, nastopi.</p>

Learning and teaching methods:

<p>Project working, field work, consultations, individual study, presentations.</p>

Delež (v %) /

Načini ocenjevanja:

Weight (in %) **Assessment:**

<p>Način (pisni izpit, ustno izpraševanje, naloge, projekt): Projektno poročilo</p> <p>Predstavitev poročila</p> <p>Ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)</p>	<p>50%</p> <p>50%</p>	<p>Type (examination, oral, coursework, project): Project</p> <p>Project presentation</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:

George Mejak:

- MEJAK, George. On extension of functions with zero trace on a part of boundary. Journal of mathematical analysis and applications, ISSN 0022-247X. [Print ed.], 1993, let. 175, str. 305-314 [COBISS.SI-ID 5828441]
- MEJAK, George. Finite element solution of a model free surface problem by the optimal shape design approach. International journal for numerical methods in engineering, ISSN 0029-5981. [Print ed.], 1997, vol. 40, str. 1525-1550 [COBISS.SI-ID 9983833]
- MEJAK, George. Eshebly tensors for a finite spherical domain with an axisymmetric inclusion. European journal of mechanics. A, Solids, ISSN 0997-7538. [Print ed.], 2011, vol. 30, iss. 4, str. 477-490 [COBISS.SI-ID 16025177]