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):

Identifikacija nalog iz realnega sveta. Matematično modeliranje. Numerične metode. Primerjava modelne rešitve z nalogo iz realnega sveta. Pisanje poročila.	Identification real world problems. Mathematical modeling. Numerical methods. Comparison between a model solution and real problem. Report writing.

Temeljni literatura in viri / Readings:

E. Zakrajšek: Matematično modeliranje, DMFA-založništvo, Ljubljana, 2004.

Capasso, Mathematics in Industry, Book series: Mathematics in Industry, Springer.

C. Dym, Principles of Mathematical Modeling, Academic Press, 2004.

S. Howison: Practical Applied Mathematics: Modelling, Analysis, Approximation, Cambridge Univ. Press, Cambridge, 2005.

M. S. Klamkin: Mathematical Modelling : Classroom Notes in Applied Mathematics, SIAM, Philadelphia, 1987.

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je razviti sposobnosti sodelovanja matematika z nematematiki pri reševanju problemov iz realnega sveta. 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.	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, summarazing, to educate Industrial Mathematicians to meet the growing demand for such experts.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Sposobnost komuniciranja z uporabniki matematičnih znanj, sposobnost formuliranje problemov, razumevanje matematičnega modeliranja.	Knowledge and understanding: Knowledge how to communicate with users of mathematical methods, ability to rationally formulate problems, knowledge of mathematical modeling.

Uporaba:	Application:
Reševanje problemov iz realnega sveta. Povezava z uporabniki matematičnih znanj.	Solving real word problems. Cross breeding with users of mathematical methods.
Refleksija:	Reflection:
Refleksija lastnega razumevanja pridobljenih matematičnih znanj na problemih iz prakse, kritično ovrednotenje skladnosti med teoretičnimi načeli in dejanskim stanjem v praksi.	Reflection of own understanding of mathematical knowledge by solving problems from a real world. Critical assesment of differences between theoretical and practical principles.
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.	Transferable skills: 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.

Metode poučevanja in učenja: / **Learning and teaching methods:**

Metode poučevanja in učenja:	Learning and teaching methods:
Projektno delo, delo na terenu, individualen študij, seminarji, nastopi.	Project working, field work, consultations, individual study, presentations.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt): Projektno poročilo		Type (examination, oral, coursework, project): Project
Predstavitev poročila		Project presentation
Ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)	50% 50%	Grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)

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]