



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Diferencialne enačbe v kontekstu
Course title:	Differential equations in the context of use

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	3.	6.
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type Obvezni / Obligatory

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
15		30			75	4

Nosilec predmeta / Lecturer: Blaž Zmazek

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

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

Ni pogojev.

Prerequisites:

There are no prerequisites.

Vsebina:

- Osnovni pojmi: Konstrukcija NDE, grafično reševanje, enačbe z ločljivima spremenljivkama, naravna rast.
- Navadne diferencialne enačbe: Osnovni tipi NDE, parametrično reševanje, singularni

Content (Syllabus outline):

- Basics: Construction of ODE, graphical solutions, equations with separable variables, natural growth.
- Ordinary differential equations: Basic types of ODE, parametric solving, singular integrals,

integrali, uporaba v geometriji in fiziki, Modeliranje sprememb z diferencialnimi enačbami.

3. Sistemi linearnih diferencialnih enačb, linearna diferencialna enačba reda n .
4. Osnovni primeri in zgledi numeričnega reševanja diferencialnih enačb.

applications in geometry and physics, Modeling changes with differential equations.

3. Systems of linear differential equations, linear differential equation of n -th order.
4. Basic cases and examples of numerically solving differential equations.

Temeljna literatura in viri / Readings:

E. Zakrajšek, Analiza III, 3. izdaja, DMFA Založništvo, 2002.

J. Cimprič: Rešene naloge iz Analize III. DMFA Založništvo, 2001.

W. Kaplan, Advanced Calculus, Fifth Edition. Addison-Wesley Publishing Company, Redwood City, California, 2003.

Cilji in kompetence:

Spoznati navadne diferencialne enačbe, njihovo uporabo.

Objectives and competences:

To know ordinary differential equations, their implementations.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Poznavanje in razumevanje diferencialnih enačb in metod za njihovo reševanje.
- Razumevanje in uporaba diferencialnih enačb.

Prenosljive/ključne spretnosti in drugi atributi:

- Pridobljena znanja so podlaga za mnogo predmetov v nadaljevanju študija.

Intended learning outcomes:

Knowledge and Understanding:

- Knowledge and understanding of differential equations and methods of their solution .
- Be able to understand and implement differential equations.

Transferable/Key Skills and other attributes:

- The obtained knowledge is a basis for many of the later subjects.

Metode poučevanja in učenja:

- Predavanje
- Laboratorijske in seminarske vaje
- Individualno delo
- Praktična demonstracija
- Uporaba IKT

Learning and teaching methods:

- Lectures
- Lab- and seminar exercises
- Individual work
- Practical demonstration
- Applications of ICT

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Pisni test – praktični del	50%	Written test – practical part
Izpit (ustni) – teoretični del	50%	Exam (oral) – theoretical part
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.

Pozitivna ocena pri pisnem testu je pogoj za pristop k izpitu.		Passing grade of the written test is required for taking the exam.
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Reference nosilca / Lecturer's references:

1. PRNAVER, Katja, ZMAZEK, Blaž. On total chromatic number of direct product graphs. *J. appl. math. comput. (Internet)*, 2010, issue 1-2, vol. 33, str. 449-457.
2. ZMAZEK, Blaž, ŽEROVNIK, Janez. The Hosoya-Wiener polynomial of weighted trees. *Croat. chem. acta*, 2007, vol. 80, 1, str. 75-80.
3. ZMAZEK, Blaž, ŽEROVNIK, Janez. Weak reconstruction of strong product graphs. *Discrete math.* [Print ed.], 2007, vol. 307, iss. 3-5, str. 641-649.
4. ZMAZEK, Blaž, ŽEROVNIK, Janez. On domination numbers of graph bundles. *J. Appl. Math. Comput., Int. J.*, 2006, vol. 22, no. 1/2, str. 39-48.
5. ZMAZEK, Blaž, ŽEROVNIK, Janez. On generalization of the Hosoya-Wiener polynomial. *MATCH Commun. Math. Comput. Chem. (Krag.)*, 2006, vol. 55, no. 2, str. 359-362.